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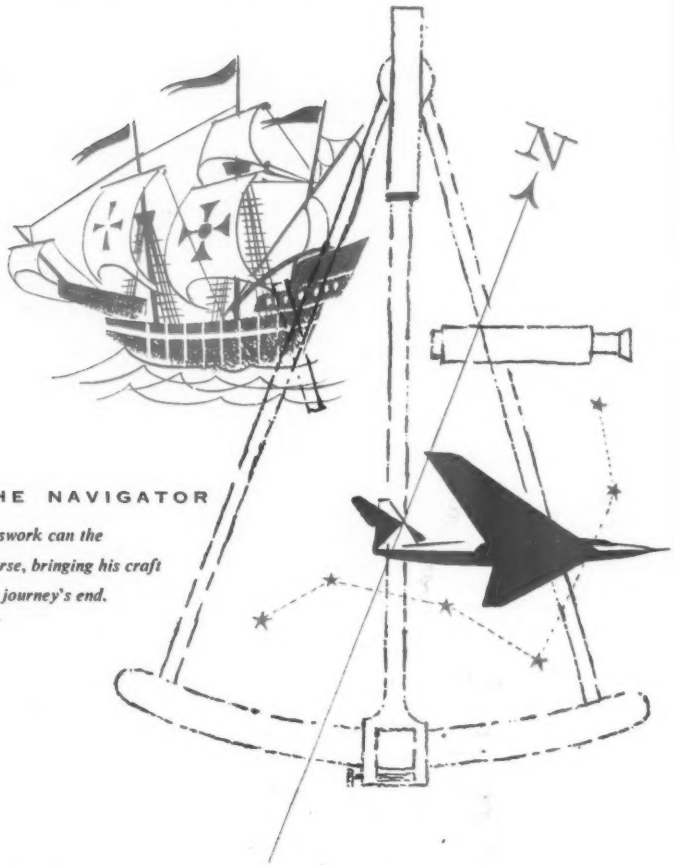

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The Shape of Things to Come

The Federation of British Industries has just published for industrialists a survey* of the European Free Trade Area which certainly clarifies the subject but gives no direct lead. Wisely, it stresses the gradual character of the proposals that have been put forward. The account of the Belgium/Holland/Luxembourg scheme (Benelux), which has been in operation since 1948, can be considered as a miniature prototype effort on international free trade and to our mind—though it is contained in the appendices—should be read first. Even here, complete economic union has not been established, because of differences in production costs, and trade in agricultural products is still restricted. Probably the most important field in which economic union has not been realized is labour. However, it is reported that trade between the participating countries has been doubled between 1948 and 1955.

The European Coal and Steel Communities' activities (appendix 111) should next be read, for here again is a history of what has been accomplished on a sizeable scale (but in a restricted field) since 1952; it probably indicates the sort of set-up to be expected when the European Free Trade Area comes into existence. The main sections of the new booklet take the subject much further than any earlier publication in Britain; details are given of the Treaty establishing a European Economic Community which was signed in Rome on March 25, by Belgium, France, Germany, Holland, Italy and Luxembourg. A chief feature of the Rome treaty is that it declares to be "incompatible with the common market, forbidden and null and void all agreements between firms, decisions of trade associations and concerted practices which can affect trade between the members and which have the object or effect of restricting or distorting competition inside the common market." This, and the subsequent paragraphs very much resemble the recent provisions of the Restrictive Trade Practices Act.

There are so many facets to the proposals so far discussed by the various bodies studying them, that we suggest every organization and individual should read with meticulous care what is contained in this Report. For instance, there is to be under the Rome treaty, free circulation of workpeople within the Community at the end of a transitional period. Unless wages are stabilized throughout the area, then the isolated case of Mr. John Charles (the footballer) may well result in mass migrations. Furthermore, a European Social Fund is to be set up to promote employment and mobility, to make grants for re-training and resettlement and for temporary assistance to un- or under-employed workers. Transport, the Ottawa Agreement, GATT, customs tariffs, all come in for consideration and make the FBI Report a most comprehensive study of what is obviously a most difficult problem.

* "European Free Trade Area" Published by the FBI from 21 Tothill Street, London, S.W.1.

Correspondence

BRASS AND BRONZE TEST-BARS

To the Editor of the FOUNDRY TRADE JOURNAL.

SIR,—I notice that in your JOURNAL of April 25, on page 513, there was some reference to work on non-ferrous test-bar design—a matter in which I, reluctantly become involved from time to time.

I believe it was at the Buxton IBF conference, I queried the value of test-bars, their purposes, and manufacturing methods used for their production relative to metal specifications and the production conditions of castings—a question which to my mind has never been satisfactorily answered. The results of test-bars taken from castings and from independently-cast bars rarely, if ever, coincide.

While the test-bar illustrated in Fig. 2 of the article is stated to be a modified IBF type, I do not personally understand exactly what this means. Can one guarantee this type of bar and identify it with castings, each and every cast, if pouring temperatures used for the test-bars and castings made from the same metal are identical, or is the test-bar sensitive to pouring at one temperature and the casting at another? If the latter, relative bars at relative temperatures should be taken to give true data. The bar made at the same pouring temperature need not be attached to the casting, but if further data are needed to assess the variation of test-bars, then three bars could be cast. One may be surprised to find which of these meets the standards laid down.

Finally, in Fig. 2 of the article, surely the spread of the two pressure-head feeders sets up directional stresses during solidification, and could cause initial stress upon the actual gauge-length of the test-bar? Out of 100 bars cast using the method illustrated, I would be interested to know the percentage of failures. I would also be interested to know whether any tests have been carried out on alternative bars poured at identical temperatures and if so, what were the differences in the results obtained. For my own test-bars in gunmetal and phosphor-bronze, I have found that by running direct, and using an off-set feeder at the other end, one can maintain a measure of consistency of 99 per cent. choosing suitable pouring temperatures, but if test-bars are cast separately, one at the agreed temperature and one attached to the casting, the variation in results is considerable. In this case, I maintain any test-bar only serves the purpose of determining the quality of the material at the particular temperature of pouring (and at the other ruling conditions), and it can only be a general inference that the castings may be of the same strength. No doubt many castings have been rejected due to failure of a test-bar representing them, and yet the material for its job was quite adequate.

The structural design of castings, runners and feeders, has a wide effect on solidification rates, and this may or may not influence other variables, often overlooked at a casual glance, and cause rejection of test-bars and castings.

Similarly, one could discourse at length about the reasons for and against a number of references in literature to the value of test-bars. I am all for having test-bars to cover specific and reasoned properties, but I do not feel that founders are yet able to be adamant that test-bars are the beginning and end of all things required to assess the requirements to which a casting may be subjected.—Yours, etc.

T. H. WEAVER.

Hall Green,
Birmingham.
May 1, 1957.

"The World that Nature Forgot"

A press reception on Wednesday, May 8, at the Cafe Royal, London, was held to give details of the forthcoming 1957 Plastics Exhibition, at Olympia, July 10 to 20. The reception opened with a film entitled "The World that Nature Forgot," produced and filmed at the Monsanto Chemical works, USA. This detailed the development of plastics from the raw-material stage to the finished product, and gave a clear picture of some of the USA applications in this field. The film was followed by a "brains trust," in which a panel of UK plastics experts were questioned by the audience. One of the questions asked was on the possible replacement of steel castings, for engineering purposes, by plastics. The panel were unanimous in their answer, which was to the effect that the plastics industry did not claim that they were universal providers. The capital outlay for cutting dies for a plastics product was prohibitive if the quantity to be produced were small, and in addition the mechanical-property requirements would preclude the use of plastics in this field. In answering a question concerning the relationship between the increased tonnage of plastics components produced and the stability of the pressure-die-casting industry, the panel again drew attention to the mechanical properties of the end product. However, they were of the opinion that the attractive finish and price in some cases of plastics products might have some impact on the foundry industry, when one considered mass-produced articles of small dimension. Regarding the mechanical properties of plastics products, the panel stated that the plastics industry had as yet only "scratched the surface" of the possible applications of plastics.

Electrical Steel Makers' Guild

A new technical society to be known as the "Electric Steel Makers' Guild" was inaugurated on May 1. The purpose of the Guild is to promote progress in the manufacture of steel for commercial purposes in electric melting furnaces, and to encourage free discussion and exchange of information of mutual interest to members.

Membership is limited to executives who are regularly employed directly in the manufacture of electric-furnace steel for commercial use and meetings, which will be held two or three times each year, will be quite informal. No records of technical discussions will be made or published and members will be encouraged to discuss freely their own and others' problems. A similar society which has been in existence for the past 25 years in the USA has been highly successful and enjoys great popularity in the industry.

The officers appointed for the Guild's first year are:—As president Mr. R. Lamb (Hadfields, Limited), as vice-president Mr. F. T. Bagnall (Samuel Fox & Company, Limited), and as secretary Mr. A. Mettam (English Steel Corporation, Limited, Grimesthorpe Works, Sheffield, 9).

IBF Conference "Deadline"

Readers are reminded that the latest date for receipt of booking forms for the Institute of British Foundrymen's Harrogate Conference (June 19 to 21) is May 18; before this date the forms of intending participants should be sent to the secretary, Mr. G. Lambert at St. John Street Chambers, Deansgate, Manchester 3. Hotel bookings have to be made independently and here again early application is recommended.

Two Grey-iron Foundries:

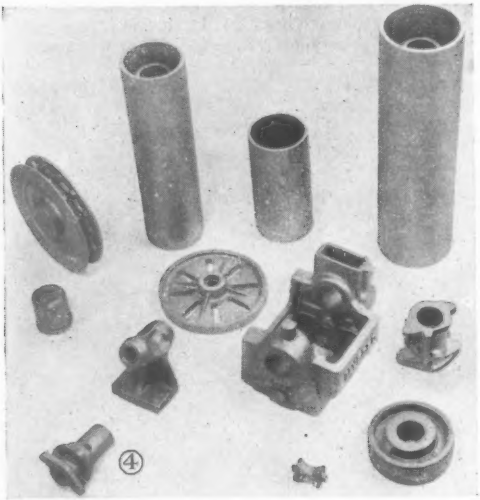
Some of the developments and methods practised at the two foundries of Chamberlin & Hill, Limited, are described by the managing director, Mr. M. M. Hallett, M.Sc., F.I.M., in what follows. Both are grey-iron foundries; that at Walsall produces high-phosphorus grades of metal for electrical, textile, small tools and domestic uses, and the one at Lichfield—a completely new foundry—furnishes castings of thin section mainly for engineering applications. Particulars are given of development work which has resulted in specialized application of shell moulding, shop heating, cupola charging plant and stack-gas washing, and annealing, and a note is included on systems of working and amenities provided for the workpeople.

The works of Chamberlin & Hill, Limited, at Walsall, where the head office is situated, are engaged in the production of large numbers of thin castings with an exceptionally good surface-finish in high-phosphorus grey iron (Figs. 1 to 3). The production is mainly by snap-flask plate moulding on hand-press machines but also includes a proportion of plaster oddside moulding. The castings are

FIGS. 1 TO 3.—*Groups of typical castings produced by Chamberlin & Hill, Limited, at their Walsall foundry. Fig.* 1—*Selection produced for the electrical industry; Fig.* 2—*a group of valve wheels of four main types, and Fig.* 3—*a group of domestic-appliance castings.*

mainly for the electrical, textile, small-tool and domestic industries, but valve wheels, which are supplied in a very wide range of sizes and types in a japanned condition with broached holes, form a specialized finished product.

The Lichfield works, which have been completely rebuilt in the last three years, produce large numbers of engineering castings in section thicknesses from ¼ to 1 in. (approximately) using low-phosphorus grey iron (Figs. 4 and 5). A major proportion of the production of this foundry is on a mechanized system involving a line of moulding machines, roller conveyor tracks and a completely mechanized sand plant. In addition, there is a substantial production by the snap-flask plaster-odd-side technique and some plate moulding. The industries served are mainly the engineering industries, including those using heavy-duty roller conveyors, small machine- and hand-tools, textile machinery and specialized railway equipment.



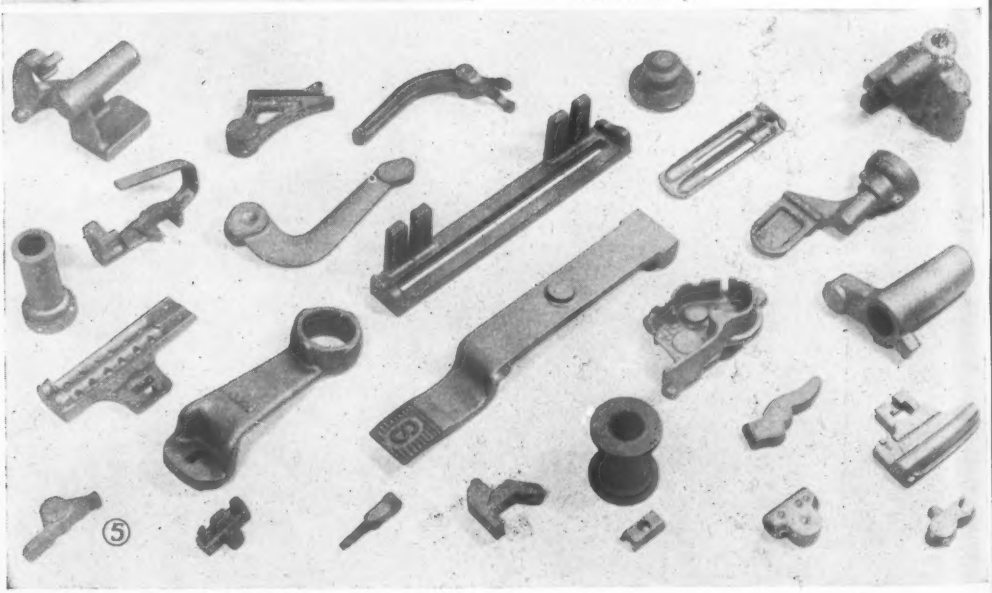
Amenities

Both works are provided with new showerbath installations and locker rooms in accordance with the latest Foundry Regulations. The percentage of usage in the showerbaths is high, ranging from 30 to 50 per cent. The Lichfield works are outstanding on account of their attractive situation set well back from the road in an extensive garden with pleasant lawns and abundant flower-beds.

Works Heating

The Lichfield works are provided with a central-heating plant which incorporates steam-heated panels in the foundry and auxiliary departments. Since molten metal is being poured for most of the working day, the heating problem is less difficult than at Walsall and the panels suffice to avoid excessively cold shops at the beginning of the working day. It has been found necessary to have a special steam circuit to the fettling shop because,

FIGS. 4 AND 5.—*Castings produced at Chamberlin & Hill's Lichfield foundry; Fig. 4 for general engineering purposes and Fig. 5 mainly for the textile industry.*



when on a common circuit, this relatively cold shop tends to suffer when the heating is controlled by the requirements of the foundry.

At Walsall, molten metal is usually circulating only for half of the day and the heating requirements are therefore more severe. As at Lichfield, it was decided to install a radiant-heating system since this tends to give the most satisfaction to the operatives and since foundry ventilation is normally good enough to make air-heating systems uneconomical. Gas was selected as the heating medium, partly because of its great flexibility and partly because of the low capital cost of the

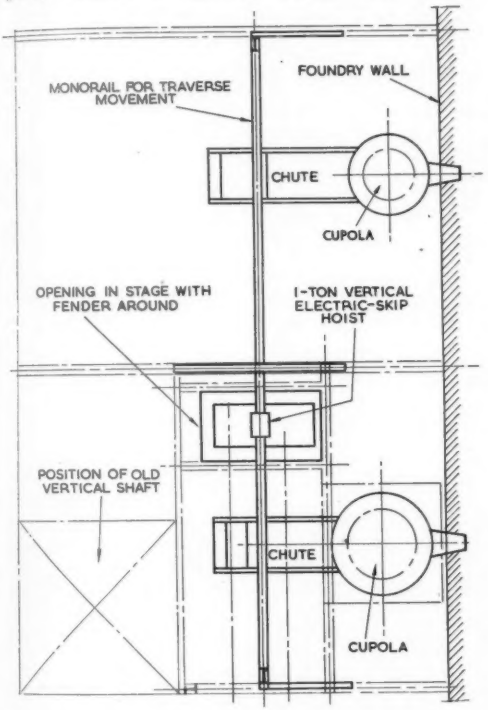


FIG. 6.—*Plan view at charging level of a pair of cupolas 16 ft. apart, indicating the position of the vertical hoist and transverse movement of the loaded skip to either cupola.*

installation. The heaters consist of a series of panels (Fig. 9). The panels, with over-all dimensions of about 4 ft. 3 in. by 3 ft. 5 in., consist of two sheets mounted vertically but arranged at a slight angle to each other, forming a vee. A series of small gas burners are arranged along the base of the vee, the hot products of combustion rising between the panels which radiate outwards the available heat. These panels are of simple construction, low capital cost and give absolutely no trouble in maintenance. They may be individually controlled, but it is better to control them from one central point. They are distributed over the whole of the area of the foundry, a little above head level, and each serves to keep warm four men who are evenly dispersed in the vicinity. The maximum consumption of each panel is 50 cub. ft. of gas per hour. The procedure is for the panels to be lit at 6 a.m. so that the foundry is comfortably warm and moulding starts immediately the men arrive. By 9 a.m,. except on two or three of the very coldest days in the winter, the panels are turned off by the wish of the operators. The running costs are therefore gratifyingly low, yet the panels have certainly achieved their objective.

Cupola Charging

In each works, the cupolas are charged by a somewhat unconventional arrangement involving a vertical hoist of the charging skip followed by traversing the loaded skip to either of the two cupolas as required (Fig. 6). For this, a traversing hoist-block is employed, equipped with limit switches. The system at Lichfield is fully automatic, being controlled from a press-button panel at ground level. The Walsall equipment, which is similarly controlled from ground level, is semi automatic but it is intended to make it fully automatic in due course. As compared with the normal skip-charging up an inclined track, the vertical hoist employed takes up a little less ground space, is a somewhat simpler structure and leaves clearer the space near the cupolas. It is also more convenient for serving two cupolas which are placed rather further apart from each other tnan normal because with the popular arrangement of a central inclined skip discharging sideways to either cupola as required, the skip would have to be carried to a great height to give sufficient angle of fall on the side chutes.

Wet Washer on Cupola Stack

The cupolas at Lichfield are fitted with the normal dry-baffle spark-arresters but, to gain experience, one of the cupolas at Walsall has been equipped with a wet-baffle spark-arrester, to the designs of the British Cast Iron Research Association (Fig. 7). A complete description of this equipment was given to the London branch of the Institute of British Foundrymen at its November meeting, and it may be stated that the wet washer has proved entirely satisfactory in preventing the deposition of troublesome dust on neighbouring dwelling houses and in maintaining the roof and guttering of the foundry completely clean. Several designs of water spray have been studied, but the one giving the best general performance produces a conical spray of fairly fine droplets which cools the arrestor assembly and efficiently washes the emerging gas. The system involves recirculation of water (which is treated with soda ash) but there have been no maintenance troubles during the nine months that the system has been in operation. At the end of the day's run, the water level in the settling tank is allowed to drop, and when the cupola is cold the whole of the water is discarded to enable the deposited grit to be removed from the settling tank. This also avoids an

undue concentration of salts in the circulated water. The overall capital cost of the system is likely to vary from £1,000 to about £1,500 depending on the size and number of cupolas to be catered for.

Shell Moulding

A mechanized shell-moulding unit is working at Lichfield and is steadily turning out castings at low scrap rates and with no returns from the customer. The equipment used was almost entirely manufactured by the Polygram concern. Instead of undertaking a large number of shell-moulding jobs, work has been concentrated on a very small number of different components, thus avoiding dissipation of effort and permitting much more standardization. This policy is felt to be a wise one and has certainly kept the plant busy and given satisfaction to the customers. A typical case of a shell-moulding application at the Lichfield works is a roller-conveyor bracket. The original job was cast in green-sand without any coring out. With the casting so produced, the hole to take the bearings had to be rough drilled, fine drilled and reamed and in addition, bolt holes had to be drilled in the base. There was difficulty in holding the castings for the jig drilling operations as the base was not absolutely flat. Shell moulding has permitted the casting to be considerably lightened, and the base and bolt holes have been cored-out. The bearing holes have also been fully cored-out. As a result of the greater over-all accuracy, the customer now has only to fine drill and ream, so that the finished job is obviously both lighter and cheaper. (A shell-moulded bracket casting of a similar type is shown in Fig. 8.)

Annealing

Another unusual feature of Chamberlin & Hill's operations is that an appreciable proportion of the total output of grey-iron castings is supplied fully annealed. The ferritic castings resulting from this operation have outstandingly good machinability, which is particularly popular in industries for which the castings have to pass through extensive machining operations but where there are no severe demands for wear resistance. A battery of oil-fired annealing furnaces is used for these operations, the temperatures being automatically controlled and recorded. Oxidation is prevented by packing the castings in heat-resisting containers.

General System of Working

In the plaster-oddside and plate-moulding sections of both foundries, operations are carried out by a development of the system widely employed in the Black Country in which each operator works in his own definite space and carries out practically the whole of the operations (see Fig. 9). This is, of course, contrary to much present-day foundry thought, but the method offers a number of advantages. From the psychological point of view, the operator has the satisfaction of knowing that he himself is entirely responsible for the job. It is probably less fatiguing because the operator is able to vary his occupation from time to time. Good housekeeping is essential for efficient operation of the method, and both foundries are notably tidy. Another of the most important advantages is that there is no waiting time, as there is always some alternative job for the worker to do, whereas in any gang system the slightest delay holds up a number of operatives. In numerous tests, the work of men ganged together over a protracted period has never approached the output achieved by the same number of men working individually.

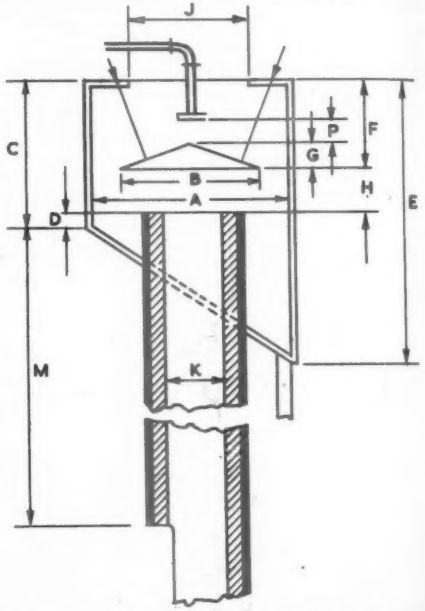


FIG. 7.—*Sectional sketch of cupola stack washer installed at Chamberlin & Hill's Walsall foundry (to designs furnished by the British Cast Iron Research Association*).*

ADDENDUM

During a symposium held in London to discuss, *inter alia*, the cupola wet washer installed at Chamberlin & Hill's foundry, Mr. Hallett gave the following additional information:—

The size of the water-outlet pipe at the top of the cupola was 3-in. dia., and from the bottom of the spray to the top of the cone was 18 in. Broadly speaking, the device eliminated the whole of the coarse particles of dust, but the fine particles were not touched; however, they were not the ones which caused the trouble with gutters, roofs, or the

* Typical dimensions and water consumptions of washers to suit various sizes of cupola are given in Table III of the paper "Emissions from Cupolas," by F. M. Shaw, G.I.MECH.E., printed in the FOUNDRY TRADE JOURNAL, August 30, 1956.

neighbours. He thought the amount extracted was about two-thirds of the amount of dust believed to be emitted, although it was extremely difficult to measure. Normally, the cost per cupola of fitting the device, when dealing with more than one furnace, would be between £1,000 and £2,000; with a pair of cupolas, which was the normal installation, the same pump and tank and part of the same piping would be common to both.

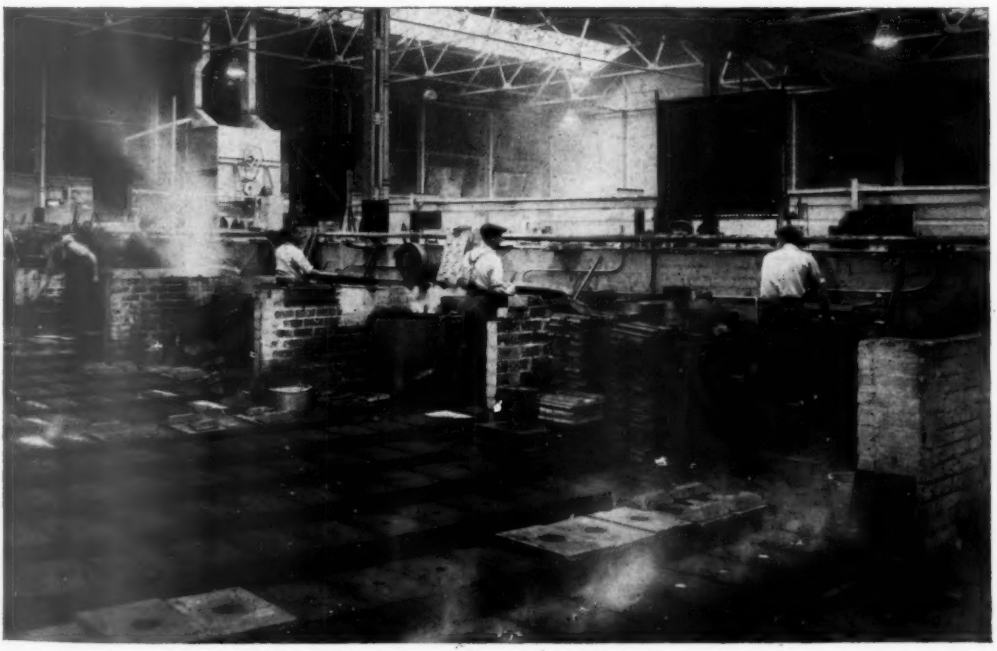
The water in the system was changed every day; the tank capacity was about 1,500 gall. and the dust was removed. About two hours before "blowing down," the water inlet was closed and automatically the level began to fall; not all the water was wasted, as it could be used for quenching "the drop."

Other Details

On the question of spray carry-over, Mr. Hallett said that it depended very much on the type of spray. With a fine spray, the amount of carry-over was very small indeed, and this was why the apparent evaporation loss was reasonably low. If the spray were to strike high up on the expansion chamber, the carry-over would be high. The dust in the tank settled over-night, leaving clear water. Next morning, a valve in the bottom was opened, the water running out through a hose into a drain. The sludge left was shovelled out by hand; it amounted to only 3 or 4 cwt. at the most, so that it was not a very arduous job. The pump was an ordinary impeller pump, but, because of fears concerning wear, a bronze impeller was inserted and

FIG. 8.—*Shell-moulded bracket casting, of the type for which the process shows economies over manufacture in green-sand moulds.*

FIG. 9.—*General view of operations at Chamberlin & Hill's foundry, employing the floor-bank system of snap-flask moulding from squeeze machines. On the low wall at the rear of the operators are shown the gas radiant-heater panels.*



Two Grey-iron Foundries

had served satisfactorily. There were no valves in the tank other than the ordinary ball-type feed valve, which handled clean water only. The water was drained off at night whenever there was danger of frost.

For reducing the whine of a high-velocity cupola fan, Mr. Hallett suggested that one simple remedy was to enclose the fan in a type of brick penthouse; air could be drawn in through surprisingly small holes.

BIF Future ?

At the official luncheon that followed the formal opening of the British Industries Fair at Castle Bromwich, last week, Mr. E. M. Clayson, chairman of the Birmingham Chamber of Commerce BIF executive committee, expressed the personal view that it would be unrealistic to maintain the Fair purely for British products, if Britain joined the proposed European Common Market. He said that the possibility of making the event an international fair had often been discussed and that a decision might be hastened if the UK decided to form part of a European free-trade area. Mr. Clayson went on to say that the Birmingham Chamber of Commerce had decided to carry on alone with the 1957 exhibition " principally because we felt sure that a general fair of this nature was required by British industry." The confidence had been justified and the actual space sold to exhibitors had surpassed the 1956 total. The Lord Mayor of Birmingham, Alderman E. W. Apps, who formally opened the exhibition, referring to the possibility of an international BIF said it was of paramount importance that British industry should not relegate the holding of general trade exhibitions to Continental countries. Mr. J. E. Belliss, president of the Birmingham Chamber of Commerce, presided at the luncheon.

Alderman E. W. Apps entertained a civic delegation from Jugoslavia at a dinner on May 6. Earlier, members of the delegation had visited the Fair, among the party being Mr. Veceslav Holjevac, president of the Peoples Committee of the City of Zagreb, Jugoslavia. Mr. Holjevac said that, if the BIF became an international fair, Jugoslavia would certainly exhibit. He presented on behalf of the delegation and his city a metal statue representing a metalworker, which had been made by a Jugoslav sculptor.

Export Information

A number of enquiries are received from time to time as to a source of information for the nature and volume of export business done in foundry commodities. One source of helpful information of this type is located in the Board of Trade Statistical Library, Room 404, Lacon House, Theobalds Road, London, W.C.1. Here import and export figures from almost every country issuing such statistics are available, subdivided as to product. Recently published are the Trade and Navigation Accounts 1956, which provide a wealth of data of this nature.

INDIAN IRON & STEEL COMPANY, LIMITED—Mr. T. C. Hornby and Mr. G. T. Routledge have been elected directors.

Prevention of Accidents

Because of limited accommodation it was necessary to restrict bookings for the annual National Industrial Safety Conference of the Royal Society for the Prevention of Accidents to 750, and this number, an all-time record, was received early in March. Equally strong has been the demand for stands at the trade exhibition which is being run concurrently with the conference at Scarborough from May 31 to June 2. The conference will be under the chairmanship of Mr. A. E. Elson, until his recent retirement, industrial safety consultant to Samuel Fox & Company, Limited, and one of the best known figures in the industrial accident prevention movement.

Among some of the subjects which will be dealt with by speakers are:—" Fire Precautions in Industry," " Safety Salesmanship," " Safe Operation of Troughed Belt Conveyors," " Safe Practices in Welding," and " Scaffolding—Carrying Out the Law." Speakers include Mr. Nigel Hannen, a director of Holland & Hannen & Cubitts, Limited, Mr. A. A. Beckingsale, regional safety officer for the South-West Region of the Central Electricity Authority, Mr. D. E. Hickish, of the Department of Applied Physiology, London School of Hygiene and Tropical Medicine, and Mr. H. E. Dyble, chief construction engineer, Gas Division of the Woodall-Duckham Construction Company, Limited.

Following the civic welcome by the Mayor of Scarborough, the president of the Society, Sir Howard Roberts, will present the Sir George Earle trophy—a silver Georgian inkstand—to the Birmingham and District Industrial Safety Group—" in recognition of its outstanding contributions over a number of years to the cause of industrial accident prevention, particularly by its initiative in establishing in Birmingham unique educational and training facilities." The donor is president of Associated Portland Cement Manufacturers.

Technical Illustration and Authorship

It is announced in the *Broadsheet* of the City and Guilds of London Institute, Gresham College, Basinghall Street, London, E.C.2, that an encouraging response has been received to their scheme for examinations in technical illustration. Last year the Institute published the regulations and syllabuses for the examinations, and now preparation courses are being provided by 23 colleges of art; 93 candidates have entered for the intermediate examination which is being held for the first time this month.

Following this success the Institute has been asked to provide a scheme in the complementary field of technical authorship, in which there is also a shortage of, and a growing demand for, competent practitioners. The technical author, unlike the technical artist, must be a qualified engineer, and he must, of course, have the ability to write clearly and concisely and be able to edit publications and arrange for their production.

A committee is being set up to explore the problem of the training and qualifications of technical authors, and, if thought desirable and practicable, to draft a scheme of syllabuses and examinations.

A MEETING of the Non-Ferrous Club, on May 2, heard Mr. Maurice Kennedy, joint managing director of Dudley Hippodrome, on "Show Business". A collection on behalf of the Royal Metal Trades Benevolent Association was later taken and the sum of £15 13s. 0d. was realized.

Fight Against Corrosion

Industry's annual bill for corrosion losses—taking metallic corrosion in the UK alone—amounts to more than £600,000,000 (this figure was quoted by Dr. W. H. J. Vernon at a recent meeting of the Institution of Civil Engineers).

October 14 to 19 of this year will be "National Anti-Corrosion Week." During this period a new impetus will be given to the use of anti-corrosion products and services. New information on corrosion and its prevention will be disseminated, and the organizers hope that publicity given to the subject will lead to a new public estimate of its importance. Two principal events are: A two-day convention, to be held at Central Hall, Westminster, on October 15 and 16. Papers will be given by leading authorities on many aspects of corrosion and its treatment, and delegates will attend from overseas as well as from this country. Engineering and technical societies, and Government departments, have been invited to co-operate. Nearby, at the Royal Horticultural Society's Old Hall, from October 15 to 17, there will be an exhibition open to the general public—the first full-scale exhibition of anti-corrosion products ever to be held in this country.

Applied Dynamics School

Edinburgh University entertained at luncheon on April 30, representatives of more than 30 firms who have contributed among them approximately £20,000 towards the establishment of the new university post-graduate school of applied dynamics. The school will provide a year's course for honours graduates in engineering, mathematics, or physics, and will include formal lecture courses and supervised research problems in the field of applied dynamics. Sir Edward Appleton, principal of the university, who presided at the luncheon, described the course as strengthening the university's efforts in an important field of industrial technology.

The university grants committee, said Sir Edward, had approved the allocation of part of their new engineering department extension to work in the field of applied dynamics, and so a special laboratory had been assigned to the subject in their plans. Since their buildings were being financed from another source, the University Court proposed to spend the £20,000 which their guests had subscribed on equipping the applied dynamics laboratory.

Aluminium Development Association

A symposium on "Aluminium in Electrical Engineering," organized by the Aluminium Development Association, is currently being held at the Institution of Electrical Engineers, Victoria Embankment, London, W.C.2. In addition to the technical sessions, an exhibition has been arranged and demonstrations of aluminium jointing practice are also being given. Brief particulars of the programme are as follows: At 2.30 p.m. on Thursday, May 16, the proceedings commence, and three papers on "General and Economic Considerations in Using Aluminium in Electrical Engineering," will be presented. On Friday morning, May 17, at 10 a.m., "Aluminium in Transmission and Distribution Lines," will be the subject of papers and discussion, and in the afternoon, at 2.15 p.m., five papers will be introduced on the theme of "Aluminium in Electrical Equipment." The proceedings terminate at 4.30 p.m.

Increased US Steel Needs

At the annual meeting of the United States Steel Corporation, the chairman, Mr. Roger M. Blough, predicted that some 50,000,000 tons of new capacity would have to be found by the American steel industry over the next 18 years to meet indicated demand. The prospect of this 30 per cent. increase on present capacity implied that the most difficult and persistent problem facing management was not temporary drops in steel output, but striving to keep pace with the enormous demand for steel that lies ahead, he said.

Judging from what was reported in the Press, many in America had become quite concerned about a decline in the rate of steel production. He said that despite some decline in the current quarter, following a drop in the industry's rate in the first quarter, overall steel demand was strong when compared with any period but the peak. There was every indication that total production this year would come close to the high tonnage of last year.

An increase in population, the expectation of a continued rise in *per capita* consumption of steel, and the increased spending power of the average American family, were given by Mr. Blough as the factors behind the anticipated increase in capacity.

Machine-tool Orders

The level of orders and deliveries in the machine-tool industry during February was down on the previous month. New orders in February (with January figures in parentheses) were:—Home, £4,440,000 (£4,960,000); export, £2,300,000 (£2,530,000). New orders in February last year were:—Home, £7,540,000; export, £2,140,000. Deliveries in February were:—Home, £5,540,000 (£6,640,000); export, £1,870,000 (£2,080,000). Deliveries in February last year were:—Home, £5,450,000; export, £1,640,000.

With home deliveries in February exceeding new orders for the seventh successive month, the value of outstanding home orders has declined to £72,290,000, which compares with £73,510,000 in January and the peak of £81,860,000 at the end of July last year. The value of orders on hand at the end of February was £96,160,000, which compares with £96,960,000 in January and £103,640,000 in February, 1956.

European Investment Casters' Conference

A detailed programme booklet has now been published for the conference of the European Investment Casters' Association to be held in Stratford on Avon from May 19 to 23. An additional paper* to be presented emanates from Germany and is entitled "Comparative Studies of Various Methods of Manufacturing Small Machine Components" by R. Schwalbe and P. Weist (Zentrogüss G.m.b.H.). So far there have been over 100 registrations for the conference, of which nearly half come from overseas.

* Brief particulars of the programme were printed in this JOURNAL, April 4, p. 408.

INCREASED PROFITS for 1956 are reported by Guest Keen & Nettlefolds, Limited. The group trading surplus for the year to December 29, 1956, has expanded from £18,532,302 to £21,309,307 after £5,742,880 (£4,222,399) depreciation. The net profit is over £1,200,000 higher at £9,556,539. The dividend on the £23,137,790 ordinary capital is raised from 12 per cent. to 13½ per cent., less tax, with a final of 10 per cent. against 8½ per cent.

H

Equipment & Supplies

Pulsating Panels for Storage Bins

The problem of preventing materials contained in bins and hoppers from sticking to their sides is not confined to the foundry industry, but it must be in this industry that it reaches its most acute forms. Over the years many methods have been put forward for preventing and curing this trouble in foundries, particularly in relation to sand-delivery hoppers above moulding machines, but only moderate success has been achieved. Thus the news of the availability in this country of the American-designed "PneuBin" device—introduced by Paterson Hughes Engineering Company, Limited, Bedford Street, London, W.C.2—is particularly interesting.

Mode of Operation

The PneuBin system (a typical installation being shown in Fig. 1) consists of steel-backed, neoprene, pulsating panels—which are mounted on the inside wall of hoppers or bins—and the necessary air controls to regulate the panels' action. By the pneumatic inflation and deflation of the panels, the bin contents are positively displaced to ensure free flow. After the panels have deflated, the air-control unit (operating off the regular foundry air supply) starts another cycle of inflation and deflation. The process continues automatically at whatever frequency is set on the air controller (frequency is adjustable).

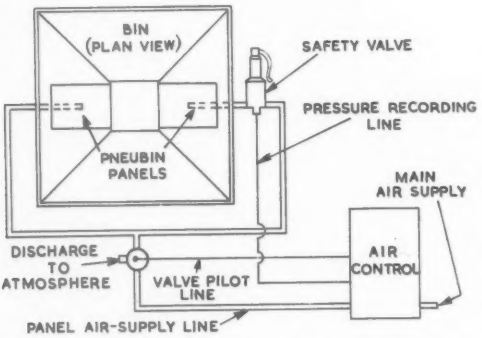


FIG. 1.—*Plan view of a typical installation of the pulsating-panel system to a hopper for foundry sand.*

When bulk material is stored in hoppers, bins, bunkers, etc., the basic reasons for flow stoppage for most materials are either bridging or funnelling. Where bridging is the problem, the positive action of the panels during inflation breaks the bridge and causes the material to flow. As the panels deflate, the unsupported material moves freely and the continuous action of the panel prevents the supporting bridge from recurring. Where funnelling is the problem, the action of the panels is to push the funnelled material away from the supporting surfaces, inducing free flow and again continuous action prevents the funnel from reforming. It is claimed that strategically located panels, combined with proper hopper design, can master the storage and movement of even the "stickiest" moulding sands.

Other attributes claimed for installations of the panels include reduced maintenance for the bin itself (because hammering is no longer necessary), and less danger to personnel (because poking of bins from above is obviated). The device is reported to be quiet in operation, easily regulated and simple to instal.

Battery-driven Rail Vehicle

An interesting battery-driven rail vehicle has been delivered to Scotts' Shipbuilding & Engineering Company, Limited. Designed and built by the Clayton Equipment Company, Limited, Hatton, Derby, it is a flat-bottomed bogie wagon for service on a rail gauge of 4 ft. 8½ in. and for conveying a maximum load of 100 tons. It is a low-loader with a height of 2 ft. 6 in. from rail to platform and is being used for the carriage of marine-engine parts from engnie shops to shipyard. The overall length is 30 ft. and the width of the vehicle is 7 ft. 6 in., being mounted on two four-wheel bogies. The outer axle of each bogie is driven by an electric motor through gearing. The battery comprises 100 Exide "Ironclad" type IMV21 cells (having a capacity of 323 ampere-hours) in fixed compartments, with hinged portions of the deck plate arranged to provide access to the cells for inspection and maintenance. The vehicle is pedestrian-controlled by a pendant-type push-button switch at both ends, with "forward," "off," and "reverse" buttons; and is capable of carrying a load of 100 tons up a 1 in 15 gradient at a speed of ½ mile per hour.

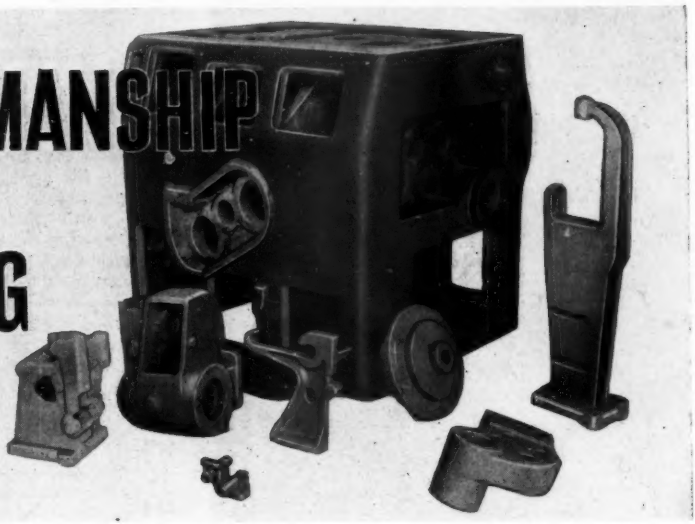
Recirculation Oven

G. R. Gilbert, Limited, of Wallington, Surrey, have recently extended their "Fyna" range to embrace forced-convection types of ovens. The advantages of ovens provided with forced recirculation are, first—the more rapid transfer of heat to the articles being dried or stoved; secondly—faster elimination of solvent or water vapours, and thirdly—ability of the oven to work at a very much higher loading density without giving rise to hot or cold spots due to load shading. The ovens are fitted with automatic-thermostatic control of gas, electric or oil heating which can be applied either directly or indirectly to heat the circulated air; and are provided with approved safety protection devices. At present this type of oven is being "tailor-made" to the customer's requirements, though it is hoped in the future to establish a separate range of basic ovens to which standard heater units can be fitted.

A SMALL, COMPACT and portable electrically-operated air compressor has been introduced by Apparatus & Instrument Company, Limited of Aico House, Vineyard Path, London, S.W.14. It is claimed to be useful in any situation where compressed air is required up to a continuous pressure of 50-lb. per sq. in., although its main use is for spray painting.

THE FLUID POWER DIVISION of the Baldwin Instrument Company, Limited, of Dartford, Kent, announce that they are now able to fit "super-cushions" to their entire range of pneumatic and hydraulic power cylinders. The Baldwin cushioning effect is produced by closing the exhaust port at a point before the piston reaches the end of its stroke, therefore trapping a certain volume of fluid. This trapped fluid is allowed to escape slowly through an adjustable orifice which controls the degree of cushioning. Super-cushioning is achieved by arranging for a larger volume of fluid to be trapped than in the case of the standard fitting.

CRAFTSMANSHIP in CASTING



by A. LAYMAN*

When the B.S.A. Tools Group acquired its foundry in Cardiff in March, 1947, the primary object was to ensure a supply of machine-tool castings for the main factory in Birmingham. This purpose the Cardiff Foundry & Engineering Company (1947), Limited, has faithfully fulfilled. There has been, however, a continually increasing demand from both inside and outside the Group for the high-quality grey-iron castings produced by the foundry, and to meet this an ambitious programme of expansion and modernization has recently been undertaken. As a result, the foundry can now produce more than enough castings to meet the requirements of the machine-tool division, and its products can be offered to other customers. The range is from 1 lb. to 4 tons as the illustration above shows.

"What impressed you most about the place?" someone asked when I returned from a short visit to the Cardiff foundry.

"The four 'esses'—Size, Skill, Sand, and Smell!" I said promptly.

Lest that sounds too naïve a judgment, let me say at once that this was my first visit to the B.S.A. Tools Group's foundry, or indeed to any foundry. And I am inclined to think that most laymen would come away with those four things uppermost in their minds.

Firstly, size. Open a door at one end of the building, and you look into an immense, high-roofed cavern, stretching away for fully 600 ft.; a vast, black expanse, pinpointed here and there with the glow of molten metal. The blackness is attributable to the sand which lies everywhere, the raw material for the moulds. Yes, black sand—for this is not the golden seaside variety but the soft, red or ochre kind which, after being used, becomes as black as soot.

There is an air of great activity in this huge main bay of the foundry. Overhead, spanning the 60 ft. width of the shop, three large gantry cranes race up and down, picking up something here, putting it down there, pausing to help in the movement of some heavy article on the floor. Machines jig and dance, whirr and shake (and almost rock and roll!).

Not So Simple

Over it all hangs the smell, the unique foundry smell, born of the meeting of molten metal with moulding sand—a distinctive, but not altogether unpleasant odour.

Most important of all, however, is the skill which is so evident everywhere. To produce a casting sounds a simple task when you reduce it to essentials—make your mould, fill it with molten metal, and wait for it to cool. But in fact there are so many details to be considered, intricate, involved, and infinitely complex details, that craftsmanship, knowledge, and experience of a high order are essential.

At Cardiff these qualities are to be found, since the up-to-date conditions of the foundry have brought in the cream of the local workers; men with years of training and experience. Some of them have been with the firm (in its Curran Group days) for many years. Even the younger men seem to have a sense of pride in their work which is all too

* Reprinted from *B.S.A. News*. Inasmuch as this article reflects the impressions of a man visiting a foundry for the first time, for FOUNDRY TRADE JOURNAL readers it might well have been entitled "As Others See Us." The article is a useful object lesson in the furtherance of "public relations"—a subject stressed editorially in a recent issue of this JOURNAL. To preserve the freshness of the impressions, the Author's own words have been reproduced, though these may not always be in the accepted foundry jargon.—EDITOR.

FIG. 1.—*In the patternshop Denis Jones gets to work on an awkward corner. He was apprenticed at the Cardiff works, and has now been there for* 10 *years.*

rare in these days of mass production. The presence of so many highly skilled craftsmen is partly due, of course, to such facilities as the ablutions block with its shower baths, clothes drying and changing rooms, and to the many recreational activities offered in conjunction with the Curran Welfare Association.

"You Never Stop Learning"

First catch your hare, said Mrs. Beeton; in foundry work it is "first make your pattern." The job of translating two-dimensional drawings into three-dimensional shapes of wood and metal is carried out in a quiet room above the foundry, full of patterns of all sizes and varieties. Modern wood and metal working machinery is used, but here again the skill of the workman is the final criterion. As one young patternmaker remarked to me: "In this job you never stop learning."

Now let us go down, with the patterns, into that huge main shop again. A closer inspection reveals that it is divided into three sections—one containing a mechanical conveyor for high-speed repetition casting; one used mainly for machine casting; and one dealing with the big, heavy work such as machine-tool bases.

Moulds for the conveyor unit are made with the help of four jolt/squeeze machines. After the moulder has placed the patterns in position inside a metal frame on the baseplate of the machine, sand is dropped from an overhead hopper. The machine then jolts up and down, shaking the sand firmly around the pattern, and finally a pressure plate is swung into place to squeeze and compress the sand into a firm, compact mould. After the wooden patterns have been carefully removed, the finished moulds are placed on the plates of the conveyor ready for casting.

These moulds are quite small, of course. The real "big stuff" is dealt with rather differently. The patterns are set in place inside a frame or box in much the same way, but sand is discharged from a Sandslinger machine, which squirts the loose, powdery stuff down with terrific force as the operator moves the head of the machine around. One of the Sandslingers is used with a rollover unit, which, as its name implies, turns the box over. It can handle anything up to 10 tons in weight.

Now to the actual casting. There are three furnaces or cupolas, which are used alternately—while one is used for melting, the others are serviced and prepared. They are set in one of the annexes which run the full length of the main bay on either side. The cupolas are charged in a gallery above the annexe, from a conveyor consisting of 40 buckets. To make sure that the ingredients (pig-iron, steel, coke, limestone) are

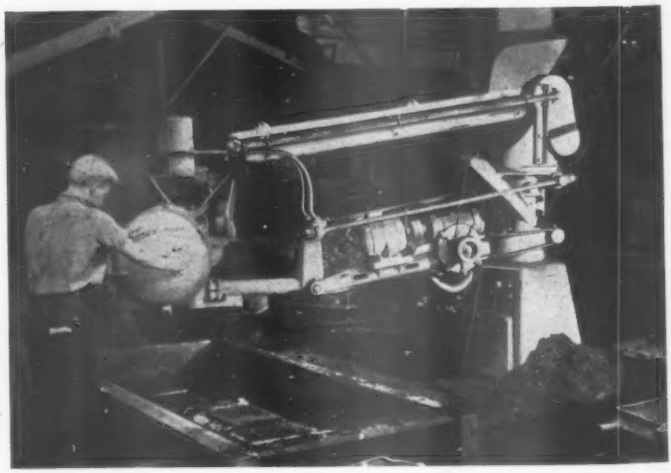


FIG. 2. — *The Sandslinger machine blasts sand down into the casting box, packing it firmly around the patterns. Its head is mounted on a system of swivels so that it can be directed into every corner.*

FIG. 3.—*A small mould for the conveyor unit is seen here on one of the jolt/squeeze machines, with moulder Bill Evans about to swing the pressure plate into place. Above can be seen the mouth of the hopper from which sand is delivered.*

FIG. 5.—*The main coreshops are in the annexes off the main shop. In one of these, smaller cores are all made by women, two of whom —Mrs. Gert Harding and Miss Ethel Henderson—are seen here. Gert first came to the foundry in 1945, left for a time, but returned about three years ago. Her colleague has had 11 years' continuous service. Starting as a crane driver, she transferred to the core-making shop six years ago.*

added in the correct sequence and quantity, each bucket is labelled with its contents and incorporates a spring balance showing the weight.

When the cupolas are tapped, the molten metal flows along a chute into a crucible carried by a monorail gantry. Sometimes this crucible is used to pour direct into the moulds passing by on the conveyor; sometimes it is carried by one of the big gantry cranes to distant parts of the foundry; sometimes it is used to fill small hand ladles for local use.

After the castings have cooled comes the task of breaking off and reclaiming the sand. That on the outside is shaken off on a vibrating grid at the "knock-out," while the core-sand from the interiors of castings is removed with pneumatic hand-tools on a smaller stationary grid. In both cases the sand falls through the grids to a collecting station below.

The castings are taken on a conveyor to the fettling shop, housed in one of the annexes. Shot-blasting is carried out a Wheelabrator machine,

FIG. 4 (*left*).—*Shaping the surface of a large mould with his special moulder's tool is Lyn Pitman. This is one of the many foundry jobs calling for a high degree of craftsmanship.*

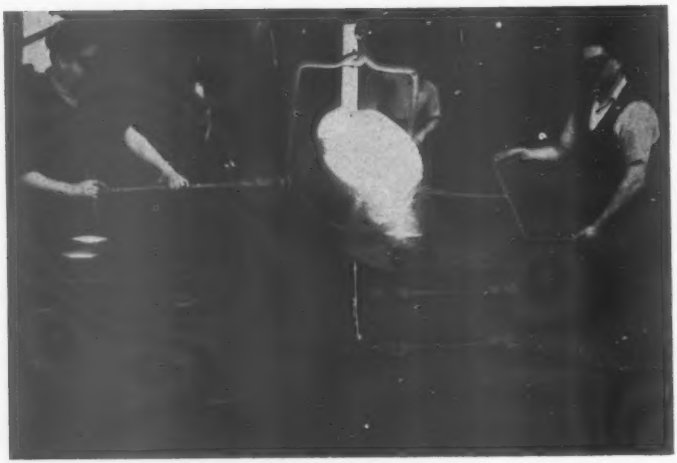


FIG. 6.—*And this is the moment of truth, the moment when the skill of the patternmakers and the moulders is put to the final test, as molten metal is poured into a mould on the conveyor. The crucible is held by Tom Kidwell and Leslie George, both of whom have been at the Curran Embankment works for about 12 years.*

which has two large rotary tables mounted on an arm and separated by a substantial screen, so that one table can be loaded while the contents of the other are being shotblasted. After this cleaning and de-scaling operation the castings are trimmed or ground, and all that remains is to give each a coat of primer before they are ready for despatch.

But what happens to the sand which has fallen through those two grids? The foundry is rather proud of its reclamation methods, so let's look at them. The used sand travels along on a conveyor belt from beneath the grids, and has new sand mixed with it before climbing, on a belt of buckets, into a large hopper. From this it is directed, *via* conveyor belts, into one of two mixing mills, where the various bonding chemicals are used, in carefully measured quantities, along with water. The moisture content is very important, and it is measured by two electrodes which give a reading on a control-panel dial.

From the mills the sand is fed into the main overhead conveyor which runs the full length of the main building. It is taken from the belt at various points, as required, for the machines below.

Waste sand goes into a 25-ton hopper mounted on stilts so that lorries can draw underneath to load.

A foundry so modern and go-ahead as this naturally places great importance on its laboratory, and that at Cardiff is exceedingly well equipped. Apart from the routine testing of sand and metal which is so necessary to maintain the high standards which have been set, there is a certain amount of experimental work done.

FIG. 7.—*Pneumatic hand tools, rather like road drills, are used to break the core-sand from the interiors of castings. The sand falls through the grid to a collecting station below. The operators: Fred Cheshire and Bernard Sellick.*

Brussels World Fair

A group display representing the British light and medium engineering and allied industries is to be organized by the Birmingham Exchange and Engineering Centre at the Brussels International Exhibition of 1958.

This is the first world exhibition to be held since the war and some 30,000,000 visitors are expected during its six months' duration. The Engineering Centre will lease a stand, to be divided between interested firms, from the Federation of British Industries, which has been invited by the Government to organize the British Industries Pavilion.

In view of the long duration of the fair and the comparatively high rental charges, it is considered that individual stands would be impractical for some firms, but many manufacturers could, however, take part in a group display as envisaged. Any firm in the engineering and metalworking industries interested in displaying its products at the fair, but which has been deterred by the problems of staffing, etc., should contact the Centre. The cost to each firm would be about £14 per sq. ft. for a minimum of 12 sq. ft. of floor space. This figure would include organization and staffing by the Centre and the provision of a stand shell scheme.

Further details can be obtained from Mr. A. J. Cox, manager, Birmingham Exchange and Engineering Centre, Stephenson Place, Birmingham.

National Society of Master Patternmakers

Annual General Meeting in Manchester

The annual general meeting of the National Society of Master Patternmakers was held in the Grand Hotel, Manchester, last week, attended by some 30 members. After the formal business had been disposed of, the president, Mr. L. Brown (Premo Pattern Company, Limited) presented his report on the year's activities in the following terms:—

President's Report

To the average member of the Society, the past year probably appears to have been without major incident, and this, to a very large degree, is quite a correct interpretation. However, the Society's Council have put in a tremendous amount of hard work, the burden of which was aggravated by the Suez crisis, and the subsequent rationing of hydrocarbon oils, with all the attendant transport difficulties. The immediate and most far-reaching effect of petrol rationing upon the Society's programme was the Council's decision to abandon the dinner/dance which was to have been held at Dudley on April 5, and substitute the new date of May 31, with a London venue. Also, it was found necessary to cancel the work's visit to the Austin Motor Company, Limited, Birmingham, arranged for February 13.

Notwithstanding these difficulties, members have enjoyed, between September and March, a most excellent programme of talks, and works' visits, and thanks and appreciation must be extended to all those who have contributed so much to these events.

Dinner/Dance

As previously remarked, the last event of the year, namely, the annual dinner/dance, is to be held at the Bonnington Hotel, London, on May 31. The brunt of the work involved in arranging this function has fallen upon the shoulders of Mr. R. Scott, and congratulations are tendered to him for the excellent way he has carried out this task.

An outstanding feature of the Society's year is undoubtedly the number of new members which have been enrolled. These have come from Birmingham, Rugby, Manchester and London and there is a very fine intake from the Tees-side area. No fewer than six companies from this area had their applications for membership approved and accepted by the Council at the meeting held on March 13, and thanks must go to Mr. Werge and Mr. Vickers for their splendid efforts in furthering the interests of the Society.

Other Activities

The activities of the Council have been concentrated during the year under the following headings:—(*a*) Arrangement of talks, works visits and social activities; (*b*) representations, after invitation, to the Timber Development Association; (*c*) British Standards Institute; (*d*) proposed insurance scheme; (*e*) Central Office of Information instruction films; (*f*) representation on the City and Guilds Advisory Committee of the Institute of British Foundrymen; (*g*) representation on the Institute of British Foundrymen's sub-committee dealing with the preparation of a glossary of terms and definitions relating to the ironfoundry industry, and (*h*) representation, after invitation, from the Foundry Trades' Equipment and Supplies' Association, on a committee investigating the possibilities of arranging a foundry exhibition in 1959. [A report on the activities of this committee has been circulated to all members and they are asked, if they have not already done so, to send in replies without delay.]

Visit of French Patternmakers

Last, but not least, the arrangements in hand for the return visit of the French master patternmakers—and their ladies—to London and district must be referred to. These are now being finalized with the local help of Mr. Scott of H. C. Hopper (Kingston), Limited, and Mr. V. C. Faulkner of the FOUNDRY TRADE JOURNAL, as follow:—The party will arrive from Paris on Thursday night, May 30, and return on Monday night, June 3. In addition to Mr. Scott's works, where a demonstration will be given by Shell Chemical Company, Limited, of casting foundry patterns in Epikote resin, the party will visit the Universal Pattern Company (London), Limited; Precision Engineering Company, Limited; B. Levy & Company (Patterns), Limited; Poplar Technical College, and the Ford Motor Company, Limited, at Dagenham. Mr. Scott, who will be assisted by Mr. Gonzalez, will be in charge of the whole programme and will be conducting the party. All the visitors will be attending the dinner/dance on the Friday night and it is hoped that the occasion will be a gala one.

Finance

The financial position, members will be pleased to note, is better this year than previously, and the proposed budget gives hope that the trend will continue. Naturally, a stronger financial position will give rise to an extension of the Society's activities, which in all cases, will be drected towards the members' benefit.

In conclusion, the president recorded his thanks to the immediate past-president, Mr. Levy, for help and encouragement extended during the year and likewise to the vice-president and members of the Council and to the Society's secretaries, Fisher & Firkins (particularly, Mr. Firkins).

At the conclusion of the report, Mr. N. Gott proposed a vote of thanks from the Society to the president, saying that Mr. Brown's responsibilities as chairman had much increased during the year and yet he had attended all meetings and fully and well discharged all the duties of his office. The proposition was carried with applause.

National Society of Master Patternmakers

Election of Officers

At the business meeting of the Society, Mr. N. Gott (of Hargreaves & Gott, Limited, Rochdale) was elected president, Mr. R. Scott was elected vice-president, and Mr. H. W. Werge and Mr. T. Ward were re-elected to the Council, Mr. T. Storey being newly elected to the Council. The officers of the Society (in addition to those cited) thus comprise Mr. B. Levy and Mr. L. Brown, past-presidents; Mr. H. R. Dowler, Mr. V. C. Faulkner, Mr. W. D. Hartley, Mr. J. J. Harvey, Mr. R. W. Mousley, Mr. E. C. Rowen, Mr. W. J. Stansby and Mr. A. Whitehouse as members of the Council. The secretaries of the Society were re-elected and Mr. A. Whitehouse was asked to continue as auditor.

Under "any other business," Mr. Scott asked for their satisfaction with the increase in membership of the Society over the year to be formally recorded, the present total being 77.

A Council meeting of the Society was held after luncheon, at which the business mainly concerned the detail arrangements for the forthcoming visit of French patternmakers and a tentative programme for next session. During this meeting, Barnards, Limited, Norfolk Iron Works, Norwich (who are much extending their patternmaking facilities), were admitted to membership of the Society.

New Catalogues

Unless otherwise stated, JOURNAL *readers can obtain copies of these publications by writing to the address quoted.*

High-tensile Brass. J. Stone & Company (Charlton) Limited, Woolwich Road, London, S.E.7, have issued a 24-page well-illustrated brochure covering the group of alloys known as "Superston." It ranks amongst the best of business literature turned out by the foundry industry and the only adverse criticism the reviewer would make is the doubtful wisdom of reproducing macrographs and photomicrographs in dubious colours. The brochure takes the reader through composition of the alloy—an aspect amplified by a leaflet contained in a folder at the back of the brochure; mechanical properties, and the important feature of castability. Then the machining properties; corrosion; wear and erosion resistance, are covered. This last factor is of special importance for ships propellers, and similar special duty castings. Some interesting figures are given under "Electrochemical Corrosion in Bimetallic Contacts," where the Superston alloy heads the list, with aluminium-alloys at the bottom, and mild steel in the penultimate position. This means that contact between high-tensile brass and steel or aluminium would tend to stimulate corrosion. The main alloy of the group covered is virtually non-magnetic and finds useful application where this property is of value. A second alloy can be applied to produce non-sparking tools, in which field it competes with beryllium/copper alloys. The cover of the brochure is especially attractive and shows the tip of a propeller cutting its way through the sea. The booklet is available to engineers' buyers and the like by writing to the Charlton address.

Blast Cleaning Plant. This is the erroneous title of a well-illustrated brochure issued by Spencer & Halstead, Limited, Bridge Works, Ossett, Yorkshire. The mistake arises because much of the modern plant described is "airless," yet the reviewer confesses that it is difficult to find a comprehensive word to describe plant which cleans the surface of metal goods by the impingement of an abrasive. A "shotting" plant has been suggested, but this does not quite fill the bill. Actually, the brochure is divided into sections, the first covering compressed air-operated shotblast equipment, and the second the airless-type which carries the trade name of "Centriblast." The great variety of types available is clearly shown by the fact that it takes 24 pages to cover the range and, even then, no detailed description is given of technicalities. Within this range, cabinet and rotary-barrel machines, blast-cleaning rooms and special automatic plants are all illustrated and described. The last few pages are devoted to dust-control plant. Finally, there is a statement that the firm's service engineers visit every user two or three times a year.

Electric Furnaces. An eight-page catalogue just released by the Hoyt Metal Company, of Great Britain, Limited, Deodar Road, Putney, London, S.W.15, covers a range of melting plant not too familiar to the foundry industry. Instead of for melting steel, brass, or cast iron, the plant described and illustrated is used for low-melting-point metals, such as white metal, tin, and bearing alloys. The range covered includes holding and bale-out pots for these alloys; oven-type furnaces for the larger bearings; and tinning baths. A special equipment illustrated is for melting lead. It consists of a Meehanite metal ladle, externally heated by nickel-chrome elements, and with a plug-and-socket connection, so that it is transportable around the shop.

Propeller Fans and their Ancillary Equipment. Woods of Colchester, Limited, Braiswick Works, Colchester, have issued two catalogues—Nos. V1220 and V3644, the former covering in great detail their Mark I propeller fans and the latter the ancillary equipment for them. In using the expression "great detail" the reviewer appreciated the breakdown of the matter into descriptions of each component and the supplementing of the information with exhaustive tables covering a wide range of sizes from 7½- to 60-in. dia. Whilst no code numbers are given, there are catalogue numbers which serve equally well.

Pattern Timber. Hugh W. Bloomer, Limited, Ashton Old Road Sawmills, Manchester, 12, have issued a four-page leaflet which details the stocks they are carrying of the four qualities available, the sizes and prices, of Quebec yellow-pine timber for patternmaking.

Metallorama. This is the title given by the George Cohen 600 Group, Limited, Cunard Works, Chase Road, London, N.W.10, to an unusual piece of direct-mail publicity, which in incredibly small space—achieved by folding into letter-card size—contains a dozen pictures representing their facilities for the purchase of scrap metal.

Skip Hoists. The latest issue (section 86) of catalogues issued by Herbert Morris, Limited, P.O. Box 7, Loughborough, describes and illustrates various types of the firm's skip hoists. Those for handling coke for gas-producers, charging foundry cupolas and for loading a bunker with ash from gas producers, are amongst the various designs included.

Notes from the Branches

South Africa

As a sequel to the meeting of the South African branch of the Institute of British Foundrymen on March 28, members and guests were invited to the demonstration centre of the Polygram Shell Mould Company (Pty.), Limited, on Saturday, April 13. That much interest was aroused was indicated by the large attendance, and, perhaps more particularly, by the presence of two members who had come from cities more than 2,000 miles apart. The production of shell moulds of up to 24 by 18 in. was demonstrated on mould makers of the hand-operated and automatic types; likewise cores were being made in both hand- and automatically-operated shell coremakers, and demonstrations were also given of vacuum-compression-pin methods of mould closing. The visitors inspected the moulds after being cast in aluminium. At the conclusion of the visit, Mr. G. F. Alexander, branch president, thanked Mr. K. H. Coombs and his staff for the interesting visit and the hospitality shown.

Meeting Report

Under the chairmanship of Mr. G. F. Alexander, the branch held their monthly meeting at the Witwatersrand Technical College, on Thursday, April 25, when a paper entitled "The Basic Cupola: Its Design and Operation" was presented by Dr. J. H. Cannon and Mr. A. L. Bradley. The Authors commenced by stating that for many years basic cupolas had been operated both in Europe and the United States with considerable success; to the best of their knowledge, however, it had not been exploited to any great extent in South Africa, and probably only foundries in the Meehanite group used this type of furnace extensively. The greatest obstacles to the further employment of this type of melting unit appeared to be the high cost of basic refractories as compared with acid, and the difficulties involved in changing from acid to basic practice. In South Africa, where the quality of metallurgical coke appeared to be deteriorating and the high sulphur-content of cast-iron was becoming a problem in many foundries, it was felt that the basic cupola could find a wide field of application, for there was no doubt that desulphurization was a costly process, when carried out independently. During the course of the lecture, the following observations were made: Materials available to South African foundrymen for lining a basic cupola are magnesite, chrome, and chrome-magnesite brick, forsterite and dead-burnt dolomite. The important properties of basic materials are: Spalling resistance; slag resistance; chemical composition; refractoriness under load; thermal conductivity and expansion. A magnesite lining should be backed with firebrick to diminish the heat loss and protect the cupola shell; in the case of rammed-dolomite linings, the material is rammed directly against the shell. Magnesite bricks, in contact with a basic slag, are resistant to burn-out and wear is normally expected to be approximately half that experienced in acid-lined cupolas of comparable output. Experience has shown, however, that it is preferable to commence repairs after the first melt. Rammed monolithic linings are considered to be preferable to brick linings, due to the elimination of joints.

"Life"

The Authors considered that a monolithic dolomite lining should run from two to four days without patching and that a new lining should then be rammed over the remains of the old one. For satisfactory cupola operation, attention must be paid to the following four main slag characteristics: Basicity, FeO content, fluidity, and slag volume. Referring to cupola design, the Authors suggested that a continuous-tapping cupola was ideal, with the slag hole situated 4 to 5 in. below the bottom of the tuyeres. Due to the difficulties of ramming cupolas of less than 24-in. dia. the Authors proposed the construction of a cupola with two melting zones which would be interchangeable, the idea being that the two "barrels" would be mounted on a pivot so that when one was in position for melting, the other would be swung clear of the cupola for ramming or patching repairs.

Discussion

Opening the discussion, Mr. S. Pienaar, senior vice-president, complimented the Authors on the excellence of their paper and inquired about the desulphurization of low-carbon irons. He received the reply that with a carbon content of as low as 2.8 to 3.2 per cent., one could achieve an efficient degree of desulphurization, and use of the water-cooled cupola for such metal was suggested. Replying to a question regarding melting rates, Dr. Cannon stated that theoretically the melting rate of the basic cupola should be slightly less than that of an acid cupola, although he knew of one operator who claimed to have a slightly higher melting rate with a basic-lined furnace.

After considerable discussion, Mr. Norman Croft concluded the proceedings, remarking that the basic cupola was a fascinating subject which, from a foundryman's point of view, should be examined more closely. He then proposed a hearty vote of thanks to Dr. Cannon and Mr. Bradley.

Australia

Three very interesting films were shown at the March meeting of the Australian branch of the Institute of British Foundrymen held at the Metallurgy Theatre, of the Royal Melbourne Technical College. The first to be shown—"The Steel Story" was a colour film of the Broken Hill Pty. Company's works at Newcastle, Australia, and the second—"Rig 20"—illustrated the technique used to free a drill which became seized during oil-prospecting operations. This was followed by a film on the mechanization of the smaller foundry, using methods particularly suited to Australian conditions. As usual the meeting concluded with a light supper.

Other Meetings

At the next meeting held on April 17, members heard a lecture by Mr. W. J. Ayre on the "Water-cooled Cupola." A round-table conference on foundry techniques has been arranged for May 15. Mr. L. B. Hannaysee and Mr. N. Rickard are to present a paper on "Moulding for Steel Castings," on June 19, and those attending on July 17 will hear a lecture by Dr. W. F. Cooper, M.B., B.S., on the "Scope of Industrial Medicine." Allied Ironfounders, Limited, have extended an invitation to members to visit their works at an unspecified date in August.

The lectures arranged for September 18 and October 16 will be given respectively by Mr. P. W. Goad, F.R.M.T.C., on "How Temperature Affects Moulding Sands," and Mr. K. Armstrong, A.R.M.T.C., on the "CO_2 Process in Australia." Finally the annual convention will be held from November 19 to 21, and the annual dinner on November 22.

Diecasters to Extend Plant

In connection with the expansion of its new flow-line system, details of which were announced recently in this JOURNAL,* the Wolverhampton Diecasting Company, Limited, has placed orders for further furnace equipment to be used with a battery of 21-in. diecasting machines. The equipment includes a 60-kw. Birlec "Tama" mains-frequency induction furnace with a capacity of 15 to 15½ cwt. and a melting rate of 11 to 12 cwt. of Mazak III alloy per hour, five 20-kw. holding furnaces of 26 to 27 cwt. capacity, five launders 11 ft. 8½ in. long and one launder 5 ft. 2½ in. long. The furnaces are all of the stationary type and will be supplied complete with control cubicles that house electrical equipment suitable for operating from a 50 cycles 400/440-v. supply. Power input to the furnaces is controlled to prevent the metal becoming heated above a predetermined level. The life of the rammed refractory lining is expected to be approximately 1½-2 years in this type of application and as no melting pots are required, iron pick-up is eliminated and dross formation is negligible.

The launders, designed to transfer molten Mazak from the melting furnace to the holding units, are provided with resistance heaters that are capable of melting the metal from cold in the event of a power failure. This equipment has proved very successful in practice. The installation is extremely cool and clean and melting losses are as low as 0.3 to 0.4 per cent.

Equipment for melting and holding Mazak diecasting alloy has also been ordered by AC-Delco, Limited, of Dunstable. The order is for two Birlec Tama furnaces, each rated at 35 kw., with a nominal capacity of about 7 cwt., to melt the alloy at approximately 5½ cwt. per hour. The furnaces will be supplied with hydraulic tilting gear for lip-axis pouring and with automatic temperature control.

* "Line Production of Pressure-die-castings," March 21 issue, p. 353.

John Gray Jubilee Scholarship

Applications are invited for the Society of Chemical Industry's John Gray Jubilee Scholarship of £150 which is tenable for one year at any approved university or technical college. Candidates, who may be of either sex, should be graduates in chemistry whose intention it is to enter industry, but those awaiting the result of their final degree examination may apply. Other qualifications being equal, preference will be given to the son of a member of the society of ten or more years' standing.

Applications must be made before September 1 to the general secretary of the society, 14, Belgrave Square, London, S.W.1, accompanied by a brief record of the candidate's school and university training; present forms of recreation; and the occupation of his or her parents. Copies of testimonials from schoolmaster and professor or tutor should be sent with the application, and the university or college at which the scholarship would be worked out should be stated.

THE BRITISH STEEL CASTINGS RESEARCH ASSOCIATION announce that their new laboratories at East Bank Road, Sheffield, will be officially opened by Sir Harry Jephcott, D.SC., M.SC., chairman of the Council of the Department of Scientific and Industrial Research. It is proposed shortly to publish a full description of the laboratories in this JOURNAL.

International Labour Organization

Problems of considerable magnitude, both technical and financial, will be created by the tremendous replacement needs in automatic machine tools, and they are likely to provide considerable food for discussion at the sixth session of the Metal Trades Committee of the International Labour Organization which met in Geneva on Monday, May 6. The committee's analysis of the impact of automation on the metal trades will precede a general debate on automation at the annual ILO conference in June, when a comprehensive report on the labour and social implications of automation and other technological developments will be presented by the director general, Mr. David A. Morse.

The report, prepared for the committee, reviews the major characteristics of technical developments and summarizes the views generally held regarding the probable rate of development of automation in the various sectors of the economy, examining some of the resulting problems from the point of view of management, workers, and the community. The metal trade is undoubtedly the industrial sector most vitally affected by automation in the immediate future, due, on the one hand, to the application of new techniques in the processing of metal goods and, on the other, to the fact that new automated equipment for other sectors of economic activity derives from this industry.

Another technical matter to be discussed is job evaluation, or the establishing of equitable relationships among wage rates for different jobs in a plant or an industry. Some managements and trade unions see in it a means of correcting the distortion in wage structures resulting from abnormalities of the employment market during the last war, post-war inflation, and the shortage of labour particularly for some skilled jobs. Some trade unions and managements are wary of job evaluation, and naturally so, for it could mean a complete revision of approach to work and wages and an entirely fresh attitude to wage negotiations.

Ten Years' Respite

Permanent permission for the development of a Bilston enamelling works has been refused by the Ministry of Housing and Local Government because the factory is considered to be a discordant feature of the planning in the locality. This was stated by the Ministry in a letter to the solicitors who acted for J. A. Jordan and Sons, Limited. The company had appealed against the refusal by the Borough Council to allow extensions at Broad Street and Cambridge Street, or the continued use of existing property in Princess Street and Arthur Street. The Minister had dismissed the appeals relating to the proposed extension, but has allowed the continued use of the property for a further ten years only.

The Minister considers that he would not be justified in granting a permanent permission, because it would prejudice the local planning authority's freedom of action, when formulating their proposals for the town as a whole. Erection of a proposed toolroom at Thompsons Yard would bring the industrial premises closer to neighbouring houses, and detract further from their amenities. The Minister has also rejected the firm's application for permission to build a permanent store on the site of an old bakery, but may allow a temporary store to be erected.

THE DUCHESS OF KENT is to tour the factory of Joseph Sankey & Sons, Limited, Hadley, when she visits Shropshire at the end of this month.

Drying of Plaster Moulds . . . . by Immersed Electrical Wiring

Modification of the Pressure-cast Process for Patternmaking

Bulletin No. 7 of the National Society of Master Patternmakers, 12, Cherry Street, Birmingham, contains the following short report of an experimental scheme, developed by the Midlands Electricity Board and Foundry Services, Limited, in conjunction with the president of the Society, Mr. L. Brown, for drying plaster moulds by immersed electrical wiring:—

The practice of manufacturing pressure-cast match-plates by injecting aluminium at low pressures into moulds of dried special gypsum plaster is well established in the patternmaking and foundry trades; the use of this method developing from a report brought back to this country by the Brass Foundry Productivity team and later developed by Mr. D. Potts of the Westinghouse Brake & Signal Company, Limited.* The use of pressure-cast match-plate equipment quickly spread, but it became apparent that one of the major hurdles was the drying of the plaster moulds, for it will be appreciated that with each pound of dry plaster is mixed one pint (*i.e.* 1¼ lb.) of water, most of which has to be removed by the application heat. Much of this water may be easily moved by heating at a very low temperature, but even so, an appreciable quantity of water is combined with the calcium-sulphate crystals. This combined water can only be removed by heating above 150 deg. C.; it is troublesome to remove but removal is essential if successful castings are to be produced.

The conventional method is to place the moulds in a recuperated air stove at a temperature of about 200 deg. C. for a period of time determined by the thickness of the plaster (*viz.* 10 hours per in.). The provision of suitable stoves presents a problem to many foundries, mainly on account of the capital expenditure involved, and to overcome this, experiments have been carried out to see if some form of heater or heating method could be evolved, the heater being "built in" to the actual slab of plaster for a low cost.

Experimental Work

The initial experiment consisted of making small blocks of plaster in which were inserted suitable heating elements. By passing varying electric currents through the heating elements it was possible to formulate some idea of input of electricity required for various drying rates with plaster of known volume. These experiments were carried out with a 2 kw. transformer, obtained from an old electric cooker. (It is probable that this sort of equipment can be found in the average works, but if purchased new it need not cost more than £20.) The transformer was operated from normal mains voltage (230 v.) and gave an output of 4 to 30 v. at 2 kw. The moulds were judged to be dry when the temperature, taken by a thermometer at the centre, reached 200 deg. C.; at this temperature all combined moisture was considered to have been driven off.

Test

In a practical example, a pattern was placed on a smooth, flat surface, a moulding box placed around it, and a crude heating element was located in the moulding zone; this element was made simply by winding iron-wire around nails on a plank of wood (the latter to ensure that the element was at the correct depth not greater than the moulding box) and evenly spread to give a uniform heating effect. After pouring the plaster in the conventional way and permitting it to set, the pattern was stripped by compressed air and the two leads then protruding from the top of the plaster mould were connected to the transformer.

From the initial experiments on the small 6-in. cubes, it had been found possible to drive off the free moisture rapidly in the early stages by applying full voltage to the element. After the free moisture had been driven off, the extraction of the combined moisture had to be effected at a lower loading, to avoid the temperature of the mould exceeding the critical figure above which severe cracking occurred. This varied slightly from plaster to plaster, but it was found to be to the order of 220 deg. C.

It will be appreciated that the electrical loading will vary with the size of the mould, but a mould 20 by 12 by 4 in., starting with an initial loading to the order of 1 kw. and reducing this to 600 w., can be dried in approximately 25 hrs.

Developments

It is felt that when further experience has been obtained the drying time can possibly be reduced. It may be necessary for the element-voltage combination to be tailor-made for the various sizes of mould but when this has been carried out it will be possible to control the operation by means of a time switch. The cost of drying the experimental mould with current at 1d. per unit. was approximately 2s. The element now used is a nickel/chromium tape which can be cleaned and re-used many times, and to enable the heat to penetrate into odd crevices of the pattern, aluminium tabs are clipped on to the element. Moulds made in this way cast perfectly well and produce good match-plates in LM6 alloy at a casting pressure of 4 lb. per sq. in.

This new development is still in the early experimental stages, but it is hoped that field trials under the auspices of the Midlands Electricity Board will be carried out at one of the major foundries in the very near future.

* FOUNDRY TRADE JOURNAL, July 31, 1952, p. 117.

Company News

R. F. D. COMPANY, LIMITED, aeronautical and marine engineers, etc., of Godalming (Surrey)—Profits increased from £120,751 to £131,214 and the final dividend was raised by 2 per cent. to 11 per cent. making 17 (15) per cent. for 1956.

WOODHALL-DUCKHAM CONSTRUCTION COMPANY, LIMITED—The dividend of 25 per cent. is being repeated for 1956 with a 20 per cent. final. Treasury consent has been sought for a 100 per cent. scrip issue which will necessitate capitalization of £600,000. Group profits were £1,087,064 (£1,042,682).

RANSOMES, SIMS & JEFFERIES, LIMITED—The ordinary dividend is limited to 6 per cent. on the £2,500,000 capital—equivalent to 7½ per cent. on capital before the scrip issue. A further setback in trade prevents a 7½ per cent. dividend which the company hoped to maintain on the increased capital. Group net balance for 1956 was £75,517 (£163,461).

PULSOMETER ENGINEERING COMPANY, LIMITED—The issued share capital of Skyhi, Limited, manufacturers of hydraulic pumps, jacks, lifts, and agricultural loaders, of Isleworth (Middx), has been acquired by the company. Mr. W. T. S. Weir and Mr. A. H. Stead continue as joint managing directors of Skyhi. Mr. F. B. Duncan and Mr. J. S. Woodrow have joined the board.

HARLAND & WOLFF, LIMITED—Important new contracts received during 1956 include three 20,000-ton liners, a 45,000-ton liner and five cargo liners. The marine engineering division continues to be fully employed and output of the land engine has been well maintained. Group trading profits amounted to £1,663,087 (£1,394,922) and the 10 per cent. dividend is the same.

POWER SECURITIES CORPORATION, LIMITED—For the fifth successive year the ordinary dividend is being raised by 1 per cent. with a payment of 11 per cent. for 1956. Group profits before tax increased from £737,633 to £761,612. Of the issued £1,500,000 ordinary capital £1,200,000 ranks for the full year's dividend, the additional £300,000 issued by way of rights last June ranking from July 1, 1956.

SOUTH DURHAM STEEL & IRON COMPANY, LIMITED—The interim dividend on the £8,000,000 ordinary is being raised from 3 per cent. to 4 per cent., for the year to September 30, 1957. The total for 1955-56 was 8 per cent. Shareholders have been told that the high level of capital expenditure envisaged for the expansion programme would in no way influence the policy, outlined at the annual meeting in January, of increasing the rate of dividend on the existing capital.

LANCASHIRE DYNAMO HOLDINGS, LIMITED—Total orders at the end of the year were higher than ever before, but, although profits were at a record level, stockholders are warned that the ratio of profits to turnover is falling and the profit margin will not be easy to maintain. Untaxed group profits of £620,387 compare with £584,554. The 11 per cent. dividend is as before, but the 7 per cent. final is payable on 374,238 additional £1 ordinary, following the purchase of J. G. Statter & Company, Limited.

Lord DUDLEY GORDON, chairman of the Hadfields group, welcomed the Lord Mayor of Sheffield, Alderman Robert Neill, on an official half-day tour of the works of Hadfields, Limited, Sheffield, on May 3. Mr. Harold Humphries, managing director, conducted the tour through the different departments.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

771,115. Tiroler Rohren-und-Metallwerke, A.G., Solbad Hall, Austria.

A process for the introduction of readily-reacting fine-grained solid additions, comprising magnesium, aluminium and/or ferro-titanium, below the surface of metal melts (in particular iron); a carrier gas is used, by which the solid is conveyed. The gas, for example nitrogen, is effective as a protective gas only at low temperatures, and will not be as effective at the high temperatures prevailing above, and in the metal melt. The solid-gas mixture is kept cool (*i.e.*, below the temperature at which a reaction of the carrier gas and solid would take place) until just before it comes into contact with the melt.

771,318. Rolls-Royce, Limited, Nightingale Road, Derby.

A lost-wax casting process, which has for its object the improving of the accuracy of the resultant castings. It involves the use of a preformed member, preferably of silica, and may, if desired, be hollow to facilitate destruction (when this is necessary to permit its withdrawal) within a hollow formation in the pattern prior to its investment. The particular application in this invention is to the formation of blades of gas-turbine engines, in high-melting-point alloys such as those containing nickel and chromium.

771,359. Foundry Equipment, Limited, Linslade Works, Leighton Buzzard, Beds., and A. S. Beech of the same address.

Improvements in foundry sand mills, consisting of a flexible endless-belt conveyor, and a series of milling rollers arranged on parallel axes extending across the upper side of the conveyor. The conveyor is held up against the weight of the millers. Agitators between the mullers are provided for mixing and turning over the sand on to the conveyor as it is conveyed from muller to muller (See also Patent No. 405,515).

771,390. Rem-Cru Titanium Inc., Midland, Penns., USA.

Titanium alloys. Improvements and modifications of the invention described in Patent No. 757,383 (FOUNDRY TRADE JOURNAL, November 8, 1956). As a result of further experiments it has been found that the total content of the additional elements may range up to 40 or 50 per cent., due to the fact that the beta-isomorphous-beta-promoters molybdenum, vanadium, columbiun, tantalum, and zirconium constitute useful additions in the higher range.

771,446. United Steel Company, Limited, 17, Westbourne Road, Sheffield, 10.

Improvements in alloy-steels having good resistance to creep at service temperatures up to 565 deg. C. In particular, the invention specifies the use of the steel for the manufacture of bolts which are also required to have high rupture strength under stress and to have low rates of creep as determined by the time taken by the steel to acquire a given strain.

THE ANNUAL DINNER/DANCE of the East Midlands branch of the Institute of British Foundrymen, was held at the Assembly Rooms, Derby, on May 3. Among those present were, Mr. H. J. V. Williams, national president of the Institute, and Dr. T. Heap, principal of Derby and District College of Technology.

Factors Affecting Ingot-mould "Life"

Importance of Correct Surface Preparation and Servicing During Use

Poor servicing of ingot moulds can waste a great amount of time, energy and knowledge expended on the making of steel. In addition much theory and practical experience can be utilized in mould design, and then be nullified by neglect, prior to casting; this leads to defective ingot quality such as cracking, and to surface defects. To reduce to a minimum losses arising from mould condition, three simple features must be observed, namely, cleanliness, temperature and coating. In a recent paper, G. Bowman, of Stewarts and Lloyds, Limited, discusses these three features. The making of ingot-mould castings is primarily the concern of foundrymen. Thus, Mr. Bowman's comments have a distinct bearing on the production methods employed in foundries.*

Dealing with the cleanliness of ingot moulds, the Author states that the reasons for scrapping a mould are generally because of severe cracking or "stickers," although prior to these stages the mould surface may be causing defective ingots. Cleanliness is imperative to ensure good ingot surface. Examination of a new mould after casting only one ingot has shown the surface covered with globules of slaggy material. It has been found that this deposit increases during the life of the mould, creating a source of pick-up for the ingot. Consequently, ingot-surface imperfections, that is, blow-holes and non-metallic inclusions, are formed. Removal of these globules from the mould wall is not easy. One method of loosening their grip on the mould wall is to quench the mould soon after stripping, however this is undesirable owing to the effect of quenching on the mould life.

Mould Temperature

Mould temperature for casting is usually in the region of 100 deg. C., because then the fluidity of the metal nor the surface of the ingot are impaired. Mould temperature and teeming speed have similar effects; the lower the temperature, the more rippled is the ingot surface, this is indicative of potential dirt entrapment. In normal practice a mould requires to be cooled from approximately 700 deg. C., thus giving a temperature differential of about 600 deg. C. This differential delays quick preparation of the mould; a possible method of reducing it is by rapid stripping in the case of big-end-down moulds, this entails stripping moulds within 45 sec. of teeming. Production and other difficulties render this method impracticable.

Complete solidification of the ingot is necessary before stripping in order to prevent displacement of the cavity should the ingot be knocked onto its side during the operation. Since for the larger sized ingots complete solidification does not occur until 40 min. after teeming, the mould at middle height has attained a temperature of approximately 700 deg. C. To clean and coat the mould prior to subsequent casting, unless the temperature of the mould is lowered to 100 deg. C. before cleaning and coating, there are handling difficulties and danger of ignition of certain types of coating. Therefore, the stock of moulds required depends not only upon the time available for cooling between heats, but mainly upon the method of cooling.

* Presented to the West of Scotland Iron and Steel Institute, last December.

Cooling curves of medium-sized moulds taken for different cooling media indicated the following cooling ratio in deg. C. per min.: Natural cooling in groups 1.8; compressed air 2.1; steam 2.3; atomized water spray 2.8; low-pressure water spray 35.0. Of these methods, natural cooling appears to be too slow for production, and water quenching too fast for reasonable mould life. A possible compromise is to cool naturally for maximum possible time, followed by quenching by low-pressure spray.

Mould Coating

Most ingot-surface defects can be minimized or prevented by an efficient mould coating, which should be volatile at a temperature slightly below that of the rising metal; non-oxidizing; easily applied; quick drying and non-inflammable. During teeming, the coating should volatilize slightly ahead of the rising metal, simultaneously causing agitation of the surface to maintain a molten state. The gases should force the floating slag towards the centre and prevent its entrapment. The coating constituents should not react with the steel; it should be of low viscosity for ease in applying.

Many substances have been tried, the latest material being obtained in the manufacture of starch from maize. A solution is made by trituration of the powder, finishing with 750 gm. per litre of water. The finished solution is in the form of a colloid, light-brown in colour, and of low viscosity. Mould temperature should not exceed 80 deg. C. and be thoroughly wire-brushed. At 80 deg. C. the coating dries very quickly, leaving the mould with a varnished surface appearance. The material possesses most of the desirable attributes but there are two critical factors which affect this type of coating. The first is the teeming speed. If this is too slow, the coating becomes charred ahead of the metal surface, enabling the carbonaceous residue to react with the metal and possibly encouraging ingot surface porosity. Fortunately, very fast teeming does not impair the efficiency of the coating and therefore it should be as fast as possible without causing ingot cracking. The second factor which impairs efficiency is the mould temperature at the time of coating. If this temperature is greater than 80 deg. C. the solution dries quickly and the powder becomes charred. However, there is little latitude between charring of the coating and the casting into a mould which is too cold or possibly damp.

News in Brief

CRADLEY CHAIN & MANUFACTURING COMPANY, LIMITED, announce that in future the name of the firm will be Cradley Chain & Castings, Limited; the firm continues to operate from Mill Street Works, Cradley, Staffs.

AT THE MEETING of the Northern section of the Institute of Vitreous Enamellers, to be held on May 17, at 7.30 p.m., at the Queen's Hotel, Piccadilly, Manchester, Mr. C. W. B. Dunning will speak on "Colour."

"INVESTMENT CASTINGS AND THEIR INSPECTION" is the title of the paper to be given by Mr. Tomkinson to the Society of Industrial Radiology, at the British Institute of Radiology, 32, Welbeck Street, London, W.1 on May 24 at 7 p.m.

SOME 250 EMPLOYEES of Armstrong Siddeley Motors, Limited, of Coventry, received dismissal notices on May 10 as a result of cuts in defence contracts. 700 employees of Henry Meadows, Limited, Wolverhampton, have been put on a four-day week.

RICHARD TURNER, Royal Engineering Works, Matlock Bath, specialists in machine, instrument design and development, tool makers, exhibited a range of their products at the Matlock Trades Fair and Exhibition, held from May 2 to 11 at Matlock Bath.

TUBE INVESTMENTS, LIMITED, announce the formation of a new subsidiary company, TI Nuclear Engineering, Limited, with head office at the Adelphi, London, W.C.2, to assist its operating companies which are concerned with activities in the atomic energy industry in the promotion of business at home and abroad.

AN OFFICIAL SOVIET DELEGATION, led by Mr. Alexey Kharin, paid its sixth visit in four days to the stand of Foundry Services, Limited, at the British Industries Fair on May 9. Afterwards officials of the firm conducted the Russians around the company's research headquarters at Nechells and the factory at Tamworth.

ON STAND NO. 33 at the 1957 Paris Aero Show, Henry Wiggin & Company, Limited, Birmingham, 16, will be displaying a comprehensive range of aero-engine, airframe and afterburner components in the Nimonic series of high-temperature alloys and in other high-nickel alloys such as Monel, "K" Monel, Inconel, the Brightray series and the Nilo series.

DIRECT REPRESENTATION in Thailand has been established by George Kent, Limited, in a drive to further increase exports into the South-East Asian area by meeting the growing demand in that country for measuring and control apparatus. A Kent branch office and workshop has now been inaugurated in Bangkok; it is at 284/1 Suriwongse Road.

IN RESPONSE TO A DEMAND from overseas for a powerful wheeled tractor for large-scale cultivation, the Marshall organization have introduced the Marshall M.P.6 diesel tractor. The Leyland UE.350-type engine, de-rated to develop 70 b.h.p. at 1,700 r.p.m., has been chosen as the standard power unit for the tractor which will be useful in a great many industrial applications.

INSTITUTE OF BRITISH FOUNDRYMEN: A meeting of the Birmingham branch will be held at 7.15 p.m. on May 22, at the James Watt Memorial Institute, Great Charles Street, when Mr. T. A. Williams will present a paper on "Light-alloy Casting Production." On the same day a visit to the works of Humber, Limited, has been arranged for the Coventry section of the Institute.

HILL & LEVETT, general jobbing engineers of George, in the Cape Province, have doubled the size of their foundry, which was established last year. An eight-ton jolt/squeeze machine which has been installed, was designed and made on the premises by Mr. J. L. Rohloff. The firm claims to be the only foundry and largest jobbing/engineering concern between Port Elizabeth and Cape Town.

UNITED STEEL COMPANIES, LIMITED, Sheffield, are using three caravans so that scientists of the new department of operational research and cybernetics can visit the various branches of the group, using the caravans as offices. One is at present working at Steel Peech and Tozer, Limited, Rotherham, and a second at Distington, Cumberland. The third forms temporary office accommodation at the headquarters of the department at Tapton House Road, Sheffield.

A PARTY OF RUSSIANS, including the Soviet Deputy Minister for Machine Tools, Mr. P. K. Taranchev, have visited the Shrewsbury factories of Wm. Asquith, Limited, and Sentinel (Shrewsbury), Limited. They were received at the Asquith works by the managing director Mr. R. Woodvine and the visitors saw there a 10-in. boring machine, which is claimed to be one of the biggest in the world. It is destined for the British Thomson-Houston plant at Larne, Northern Ireland.

A GROUP of Austria's leading metallurgists visited the Aldridge Tool and Engineering Company, Limited, Staffs, on May 7, and made a particularly close inspection of the heat-treatment department. The party are in this country as guests of ICI. One of the members, Dr. Otto Mirt, said that in the past Austria had used mainly German salt-bath furnaces but they were now considering changing to British-made furnaces and to British methods of heat-treatment of steel.

THE TREASURY have made an Order which continues for a further period of one year from May 13, 1957, the current exemption from duty under the Import Duties Act, 1932, of certain forms of nickel and ferro-nickel alloys. The new Order also extends the exemption of duty, for the same period, to nickel in the form of briquettes. Copies of this Import Duties (Exemptions) (No. 5) Order 1957 (S.I. No. 785) may be obtained from Her Majesty's Stationery Office or from any bookseller (price 3d., by post 5d.).

A LEYLAND "ROYAL TIGER" WORLDMASTER, underfloor-engined bus-chassis, of the type now on city service in Oslo, was exhibited by A.S. Autoindustri (Leyland agents in Norway) at the Oslo International Motor Show held earlier this month. Further news from Leyland Motors, Limited, is that they are giving a million-dollar overhaul to an American bus fleet which serves Washington D.C., including the fitting of diesel engines shipped to the USA by the company. The buses are 44-passenger American-built White models, at present powered by petrol engines.

DONCASTER is making its first introduction of by-laws requiring that heating and cooking arrangements in new buildings be designed to prevent smoke emission. The first stage is a scheme for smoke control in an area bounded by St. Sepulchregate, St. James Street, Waterdale, Wood Street and Cleveland Street, and Printing Office Street. The Corporation is installing oil-fired boilers in its new £750,000 College of Further Education now being erected in Waterdale. Smokeless fuels will also be used in houses and flats, to be built in a demolition area, which will come within the scheme.

Mr. A. D. BUCKLAND-NICKS has been appointed industrial field sales controller of the Shell Chemical Company, Limited. In this post he will supervise the operation of all the sales divisions and will act, when necessary, as deputy for Mr. P. J. MARCH, the new marketing manager (industrial). Mr. R. A. ATKINSON, who became Northern regional manager in 1955, has taken up a senior position with the chemical industry administration of the Shell Petroleum Company. As a result of the above changes, the posts of Northern and Southern regional managers, formerly held by Mr. Atkinson and Mr. Nicks, will cease to operate.

RUMOURS OF A TAKE-OVER which accompanied a rise of 1s. 9d. to 18s. 6d. in the shares of the North British Locomotive Company, Limited, were denied by Mr. T. A. Crewe, chairman and chief managing director of the company, at Glasgow. Asked if he could present any reason why the value of the shares should accelerate, Mr. Crewe said: "I think it is fairly well known that we are getting some very large orders. The British Transport Commission may be placing pretty large orders". Some months ago there were also unsubstantiated rumours that the company was involved in negotiations for a merger with an unspecified German firm.

EMPLOYEES OF THE Lister-Blackstone Group are to be the guests of the directors at the Bath and West Agricultural Show at Swindon on Saturday, June 1, to celebrate the 90th anniversary of R. A. Lister & Company, Limited, of Dursley, Gloucestershire, and the 120th anniversary of Blackstone & Company, Limited, of Stamford, Lincolnshire. This year not only records a total of 210 years of universal service that the two firms have given to agriculture and industry, but marks the "coming-of-age" of their association. Blackstones, which started as a small engineering and millwright's business in the Sheep Market at Stamford in 1837, and Listers, which had equally humble origin in a Dursley smithy in 1867, joined forces in 1936.

THE ROLLS-ROYCE FACTORIES in Scotland are tackling the problem of redundancy by offering contracts to selected workmen, which provide for three months' notice on either side, a holiday bonus and insurance benefits in case of sickness or death. So far these contracts are only being given to men of long and commendable service. The Rolls-Royce executives regard them as rewards for loyalty and merit; and they say that, as time passes, more will be offered. In England the trade unions have welcomed the Rolls-Royce contracts. Scots who have a genuine desire for healthier relations in industry should welcome them too, but local shop stewards, it is reported, condemn the plan because they say it is an attempt to weaken the trade union organization.

Major C. R. DIBBEN, chairman of the London Aluminium Company, Limited, and chairman of the Midland Regional Board for Industry, who has just returned from a five-week visit to the United States, said on his return that there is good business to be done in America by British manufacturers if they will go out and get it. The USA was expansion minded, "their one idea is to go ahead." Major Dibben added that he had booked a number of trial orders for his companies' aluminium products and had opened negotiations for the manufacture under licence in Britain of several new American lines. He was accompanied on his tour by Mr. Philip Webster, managing director of the Midland Metal Spinning Company, Limited, of Wolverhampton, one of the companies in the group.

BIF Briefs

The British Industries Fair currently being held at Castle Bromwich, Birmingham, will close to-morrow, Friday May 17, at 4.0 p.m.

DELTA METAL COMPANY, LIMITED (*Stand D.313 and 210*) show a profusion of specially-shaped extruded bars in brass, bronze and copper.

ROYAL MINT REFINERY. Some of the modern uses of copper are shown; there are wide coils 54-in. by 0.0015 in. of the rolled metal, as used in the manufacture of printed circuits, together with large sheets of plastic laminate, coated with copper.

BARKER & ALLEN, LIMITED, Birmingham; the speciality product displayed by this company is nickel/silver strip. It is claimed that this particular alloy offers excellent machining characteristics and in the rolled form can be blanked, pierced and formed without any difficulty while its fatigue resistance is considerable.

ROLSAN ENGINEERING, LIMITED, Birmingham; (*Stand D.*332) are showing the Ruscoe Turner semi-continuous casting machine, for the production of billets up to 24-in. dia. by 10-ft. long (singly); simultaneous casting of two billets 15-in. dia; four from 6 to 12-in. dia. or the simultaneous production of six billets up to 6-in. dia. Installation of this machine is claimed to be simple, only a small pit (9 ft. 6 in. by 8 ft. by 4 ft. 3 in.) is required.

HILL ALZEN (SALES) LIMITED, Willenhall, are exhibiting the bearing metal known as "Alzen 305." The company was formed last October, as a subsidiary of Rubery Owen, to market this metal which is a zinc/aluminium/copper alloy claimed to be able to replace any of the conventional bronzes, and superior in certain applications, having excellent running and wearing qualities with only half the density of bronze. The metal can be obtained as ingots or as chill-cast bars, cored or solid sand castings and gravity-die-castings.

TRANSMISSION ACCESSORIES, LIMITED, Leighton Buzzard; (*Stand D.*311 and 208) are exhibiting a new "Tal-let" power-pushed floor-pallet conveyor which comprises a light track upon which run a number of simple 4-wheel trucks each with a flat top. The truck frames are curved at each end to enable them to negotiate bends and can be pushed in a "train," from one process area to another, around a continuous loop of track, or any other conventional layout. Alternatively the track can be arranged in a straight length with a companion-gravity-track on which to return the trucks for re-loading. Pallet tops can be supplied in a variety of materials for different duties, and standard pallets (19 by 23½ in.) are available, ex-stock, in pinewood, mild-steel plate, cast aluminium and cast iron.

Meehanite Annual Conference

The 17th annual conference of the Meehanite Development Association of Southern Africa was held in Johannesburg on April 10, some 30 foundrymen attended from South Africa and the Central African Federation. The subjects of papers and discussions included basic-cupola operation, the use of low-cost monolithic-basic-cupola linings, the economics of nodular-iron production, the Carbon-dioxide Process, pneumatic transportation of sand and new uses of Meehanite metals in Africa. The Association's luncheon was held at the Cafe Royal, Johannesburg.

Personal

Mr. IAN LIDDINGTON, M.C., A.C.A., has been appointed a director of the Fullers' Earth Union, Limited.

Mr. A. W. POWLEY, secretary of Richard Crittall & Company, Limited, has been appointed to the board of directors.

Mr. J. D. PEARSON, chief executive and deputy chairman of Rolls-Royce Limited, Derby, has been appointed a Fellow of the Royal Aeronautical Society.

Mr. F. B. HYDE, general sales manager of Laycock Engineering, Limited, Sheffield, has been appointed co-director of the aviation division of Birfield Industries, Limited.

Mr. H. A. WINCER has been appointed foundry manager of Ransomes Sims & Jefferies, Limited, Ipswich, following the retirement, after 28 years in that capacity, of Mr. A. J. RICHMAN.

Mr. NORMAN ELCE, director and chief mechanical engineer, Metropolitan-Vickers Electrical Company, Limited, has been elected a vice-president of the Institution of Mechanical Engineers.

On Friday, May 10, Mr. D. HORSFIELD, plant development engineer at the engineering firm of J. Blakeborough & Sons, Limited, valve manufacturers, Brighouse, left for Canada to start a new career.

Mr. A. BOWKER, warehouse manager of Guest Keen & Nettlefolds Limited, Darlaston, has been elected president of Walsall Chamber of Commerce for 1957-58. He began work with the firm as an office boy nearly 50 years ago.

Mr. R. B. HOFF, at present stores superintendent, Western region of British Railways, has been appointed chief stores officer at BTC headquarters, to succeed Mr. A. FORBES SMITH when the latter retires from the Commission's service at the end of this month.

Mr. T. SHAW retired on May 3, after 53 years' service with William Whiteley & Sons, Limited, Prospect Ironworks, Lockwood, Huddersfield. Mr. Shaw, who started as an apprentice, was appointed manager in 1920. He received a gold wrist watch from his colleagues.

Mr. FELIX L. LEVY, joint managing director of George Cohen Sons & Company, Limited, has been elected president of the National Federation of Scrap Iron, Steel and Metal Merchants. He has been actively engaged in the scrap industry for nearly 30 years, and is also a director of the George Cohen 600 Group, Limited.

Mr. R. HADFIELD, a local director of Thos. W. Ward, Limited, Albion Works, Sheffield, has been elected vice-president of the Silica & Moulding Sands Association. Mr. Hadfield looks after the foundry supplies and refractories' side of his company and also represents the company on the councils of the Pig Iron Merchants' Association and the Foundry Coke Merchants' Association.

Mr. HENRY G. WEBSTER has been appointed director of engineering of the Standard Motor Company, Limited. He will operate as a special director in charge of all research and engineering development for the company and the Triumph Motor Company (1945), Limited. Mr. Webster joined the Standard Motor Company in 1932 as an apprentice, being appointed assistant technical engineer in 1938 and deputy chief engineer for design in 1955.

Mr. O. J. PHILIPSON, chairman of Richardsons Westgarth & Company, Limited, and Mr. J. R. MACKAY, managing director, have joined the board of Parsons Marine Turbine Company, Limited. Mr. Philipson has been appointed chairman in place of Mr. R. CYRIL THOMPSON, who remains a director of the company. Mr. ANDREW HOPPER, Mr. R. C. ELWES and Mr. J. B. WOODESON have left the board.

Mr. HARRY RILEY, chairman of John Riley & Son Limited, electrical distributors, Attercliffe Common, Sheffield, sailed for the United States, on Wednesday, May 8, at the invitation of the American National Association of Electrical Distributors, to be guest speaker at their annual convention in Washington this month. Mr. Riley is president of the Electrical Trades Benevolent Association and will next year be president of the Electrical Wholesalers' Federation. While in America he will visit oil firms to sell British products to them, for refineries in the sterling area of the world, and hopes also to contact the new owners of the Trinidad Oil Company. He returns to this country on June 21.

Northern Aluminium Company, Limited, announce the following new appointments:—Mr. J. H. MAYES, formerly assistant general sales manager, is now general sales manager in succession to Mr. S. E. Clotworthy. Mr. D. A. CORBETT-THOMPSON, Manchester sales area manager, is to be sales manager responsible for export sales; Mr. E. D. ILIFF, manager of the sales development division at Banbury, is to be sales manager responsible for sales development, advertising and publicity; Mr. F. LAYTON, manager of the sales administration department at Banbury, is to be sales manager responsible for all sales administration; and Mr. D. A. PINN, manager of the export sales department, is to be sales manager responsible for all domestic sales. It is intended that these four managers will all operate from the company's London office.

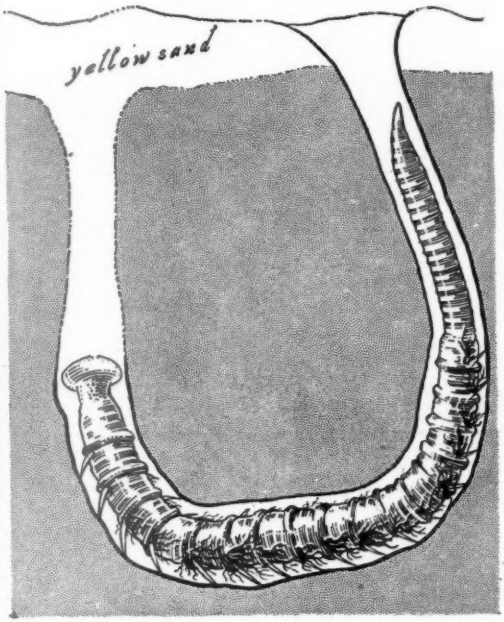
Professor WALTHER BAUERSFIELD, 79-year-old chief of the technical side of the Zeiss Foundation of West Germany, was presented with the James Watt International Medal in London, on Friday, May 10. Of the 12 recipients of the medal, Professor Bauersfield is the first German to receive it. He joined Zeiss in 1905, becoming a member of the board of management in 1908, and in 48 years of unbroken service he has advanced developments in the world of precision engineering and optics. He enriched the medical world with the operation lamp—"Pantophod," which gives shadowless lighting, and was a pioneer in aerial topography, astronomy and in water-turbine engineering. He has over 120 major patents to his credit, including the Zeiss parallelogram and the planetarium. Among the honours Professor Bauersfield has received, from many parts of the world, are the gold ring of the Deutsche Museum of Munich; the Elliot Cresson medal of the Franklin Institute of Philadelphia; the Siemens ring and the Grashoff memorial medal.

Obituary

Mr. F. COX, formerly commercial manager at Parker Foundry, Limited, of Derby, has died at the age of 64; he had been associated with the company since 1913, and retired in 1949 because of ill-health.

Mr. G. VAUGHAN died at his home on May 3. All his working life had been with the Sheepbridge Group of Companies, starting at the forge and rolling mills, he was later at Glapwell colliery and returned in 1933 to the foundries department, where he worked until his retirement six weeks ago.

Number One in Series



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Like most users of Sand the Lug Worm is highly selective, choosing the qualities of sand most suited to its needs. It swallows large quantities for the food particles therein and houses its 8″ of brown/green body in a U-shaped burrow. The "processed" sand is deposited at the tail end of its habitat.

Foundries must be equally selective in choosing the types of sand best suited to their particular needs.

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Imports and Exports of Iron and Steel in March

The following tables, based on Board of Trade returns give figures of imports and exports of iron and steel in March. Totals for the first three months of this year and last are also included.

Total Exports of Iron and Steel

Destination.	Month ended Mar. 31.	Three months ended March 31.	
	1957.	1956.	1957.
	Tons.	Tons.	Tons.
Channel Islands	485	1,494	1,022
Cyprus	1,109	803	2,495
Sierra Leone	1,254	1,723	4,192
Ghana	1,768	7,142	5,070
Nigeria	5,317	16,116	15,040
Union of South Africa	10,127	24,314	27,436
Rhodesia and Nyasaland	5,979	16,229	18,021
Tanganyika	2,470	3,207	6,810
Kenya	5,569	8,695	11,812
Uganda	386	1,602	1,174
Mauritius	197	594	859
Aden	425	1,490	1,256
Bahrein, Qatar, and Trucial States	2,410	2,280	3,987
Kuwait	2,250	477	7,076
India	26,685	79,218	81,687
Pakistan	7,464	12,601	13,222
Singapore	2,740	8,339	10,905
Malaya	2,283	8,378	10,409
Ceylon	2,773	8,742	8,302
British North Borneo	311	1,563	859
Hongkong	5,972	14,440	29,170
Australia	11,235	61,033	49,289
New Zealand	24,947	49,247	47,775
Canada	21,911	60,706	55,948
Jamaica	2,337	6,368	4,651
Trinidad	4,434	10,186	10,211
British Guiana	618	1,517	1,442
Other Commonwealth countries	2,697	5,718	8,303
Eire	4,314	16,954	11,113
Finland	7,723	11,072	22,983
Sweden	8,837	29,825	25,586
Norway	8,722	20,807	28,084
Denmark	11,349	13,831	29,074
Western Germany	454	3,104	5,190
Netherlands	9,130	23,027	29,630
Belgium	4,702	9,425	10,634
France	363	2,228	3,731
Switzerland	2,265	3,882	6,351
Portugal	1,997	2,056	5,265
Spain	7,458	6,738	12,693
Italy	3,053	5,349	15,133
Austria	346	1,357	923
Yugoslavia	1,272	1,198	2,049
Greece	395	1,384	1,652
Turkey	98	777	1,688
Netherlands Antilles	347	3,539	1,430
Portuguese East Africa	653	684	1,284
Egypt	409	12,025	409
Sudan	81	5,338	5,456
Lebanon	634	2,485	1,156
Israel	557	3,464	1,166
Saudi Arabia	280	1,999	1,537
Iraq	3,339	10,172	8,720
Iran	3,660	16,929	11,548
Burma	1,585	1,960	4,224
Thailand	716	2,348	1,655
Indonesia	711	3,462	1,190
Philippine Republic	141	1,830	292
USA	5,632	9,966	11,543
Cuba	994	3,090	1,706
Colombia	304	583	950
Venezuela	11,761	16,989	23,845
Ecuador	359	734	877
Peru	1,715	5,008	3,183
Uruguay	1,052	1,591	2,314
Argentina	7,934	14,218	18,505
Other foreign countries	12,954	7,079	44,866
TOTAL	283,549	692,729	798,108

Total Imports of Iron and Steel

From	Month ended March 31.	Three months ended March 31.	
	1957.	1956.	1957.
	Tons.	Tons.	Tons.
Rhodesia and Nyasaland	606	649	1,229
Canada	3,483	12,985	9,232
Other Commonwealth countries and Eire	2,047	1,084	5,548
Soviet Union	16,083	78,743	45,486
Sweden	2,911	10,283	9,190
Norway	10,078	30,759	31,498
Western Germany	13,528	61,495	32,538
Netherlands	4,221	36,857	17,563
Belgium	16,256	117,403	46,955
Luxembourg	3,089	21,188	11,238
France	5,128	92,668	21,959
Italy	163	2,891	777
Austria	5,659	54,233	25,153
Japan	1,509	5,767	4,661
USA	20,868	159,899	44,341
Other foreign countries	4,615	12,123	14,329
TOTAL	110,244	699,627	321,697
Iron and steel scrap and waste, fit only for the recovery of metal	58,877	255,235	155,197

Exports of Iron and Steel by Products

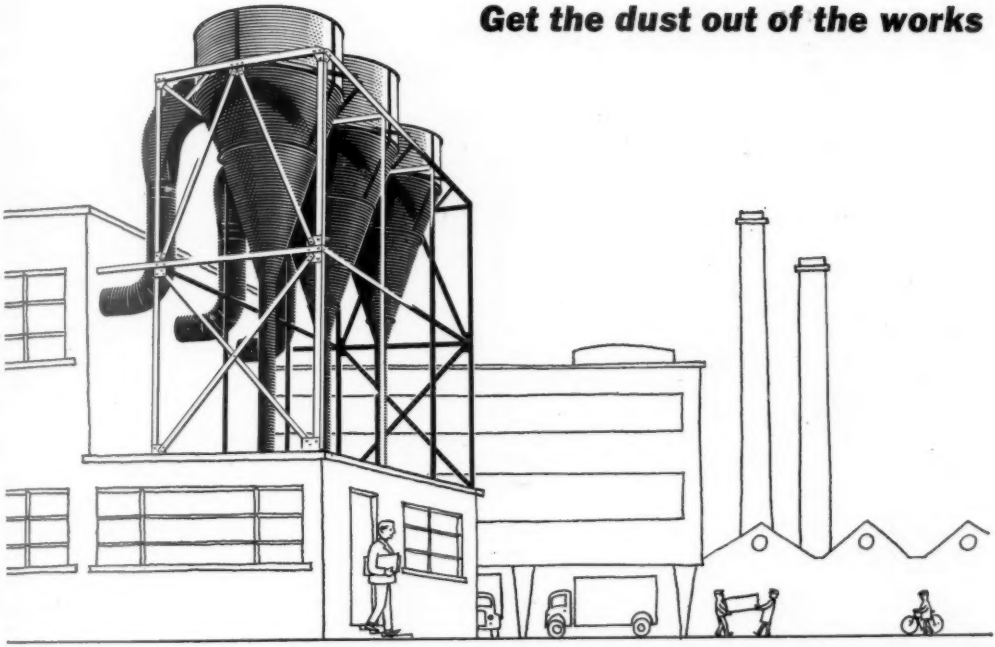
Product.	Month ended Mar. 31.	Three months ended March 31.	
	1957.	1956.	1957.
	Tons.	Tons.	Tons.
Pig-iron	6,210	26,891	46,913
Ferro-columbium (niobium)	19	46	14
Ferro-tungsten	89	276	238
Other ferro-alloys	271	790	906
Ingots, blooms, billets, slabs, sheets, and tinplate bars	122	753	443
Iron bars, rods, angles, shapes, and sections	160	468	402
Steel bars, rods, angles, sections, and shapes	41,838	104,612	124,854
Iron plates and sheets	4	70	40
Universal plates	677	1,483	1,240
Steel plates, ⅛ in. and under ¼ in.	742	2,727	2,699
Do., ¼ in. and over	16,363	58,056	47,362
Blacksheets and blackplate	33,457	58,187	88,077
Hoop and strip	9,590	24,100	35,643
Tinplate	37,545	75,210	99,178
Decorated tinplate	464	1,910	1,065
Galvanized sheets	20,705	33,538	54,235
Other (including tinned sheets, terneplate, and ternesheets)	1,702	3,570	6,022
Railway and tramway construction material	21,573	79,874	67,437
Wire rods	3,641	8,935	10,606
Wire	12,018	24,404	27,891
Tubes, pipes, and fittings	75,218	185,894	188,532
Iron castings	244	432	459
Steel castings	202	430	859
Forgings	695	1,073	1,966
TOTAL	283,549	692,729	798,108

DURHAM RAW MATERIALS, LIMITED, 1-4, Great Tower Street, London, E.C.3, announce that they have been appointed selling agents for the clays produced by Watts, Blake, Bearne & Company, Limited, Newton Abbot, Devon. The agreement has the effect of combining the technical resources of the two companies.

HEWITT'S OF CRANLEIGH (Surrey), pre-fabricated building specialists, have moved to new works at Elmbridge occupying over seven acres.

AN ORDER for equipment to be used in connection with atomic research has been given to Blackburn (Dumbarton), Limited, aircraft constructors, by Matthew Hall & Company, Limited, London, N.W.1 (acting as sub-contractors). The order is a new departure for the Scottish company.

Get the dust out of the works



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Dallow Lambert Dust Control Plants are the 'tailor-made' answer to dust. They're scientifically designed and built to measure up to your particular dust problem. Shown here are cyclones capable of handling various kinds of dust from modern high speed machinery —the result of years of research in this field.

We also make large and small Wet Dedusters and Drytube Fabric Filters: and we can fit you up 'off the peg' with Drytex and Dustmaster Unit Dust Collectors, which are adaptable to cover a great many applications. Which is the best answer to your dust problem? We don't know and we can't know until we've had a chance to study things on the spot—until you **see us for dust.**

see us for dust

DALLOW LAMBERT

DALLOW LAMBERT & COMPANY LIMITED, THURMASTON, LEICESTER.

CDC 60

Raw Material Markets

Iron and Steel

Blast furnaces continue to maintain record outputs of pig-iron, and the fresh units recently blown in are adding appreciably to available tonnages, mainly in the basic steelmaking grade. Iron-ore deliveries are adequate for both consumption and stock requirements. For the first three months of the year imports were increased by over 120,000 tons as compared with the same period last year, and supplies from home sources were also at increased levels. Blast-furnace coke has also been sufficient to burden the furnaces and the increased coal outputs ensure a continuity of good supplies. There is no slackening in the demands from the steelworks for basic pig-iron and in most areas adequate tonnages are being received by the melting shops, whose requirements will continue on an increasing scale as the schemes for additional outputs of steel come into operation. This, together with the intention of the steelworks to increase the percentage of pig-iron in their mixtures, will entail larger supplies than are at present forthcoming.

In the ironfoundry trade, the main item of interest is the improvement in business in the motor-car industry. This promises to bring a continued improvement in the demand for castings requiring increased tonnages of pig-iron when present stocks of castings and pig-iron have been used up. Some of these foundries are already taking up additional tonnages of low-phosphorus pig-iron and hematite. The tonnages available are adequate to cover present requirements and the furnaces have some stocks, but these are not large and, with the requirements of other foundries supplying high-duty castings to many trades, it would require only a small overall increase to absorb quickly available stocks and production. Refined iron is not in heavy demand.

The light-casting trade continues to suffer from a moderate demand, although some of these foundries are better employed than others. Textile foundries also are only partially engaged, but many of the jobbing foundries are fairly busy. High-phosphorus pig-iron is in good supply and more than sufficient to cover present needs. Producing furnaces find it necessary to add to stocks and have tonnages available for export when licences can be obtained. The foundries appear well provided with all the grades and tonnages of scrap they require, and deliveries of foundry coke, ganister, limestone, and firebricks are satisfactory.

Many of the re-rollers have received recently consignments of steel billets from overseas and with the deliveries from home steelworks they are fairly well off for supplies, particularly in the larger sizes. Present usage is not so heavy as it was, as the recent falling off in demand for small bars from stockists and consumers has not yet been arrested. This has not reduced outputs to any great extent, but has had the effect of enabling the re-rollers to deal with the orders on hand more promptly. For reinforcing rods there is a heavy demand, and the strip re-rollers are benefiting from the improved conditions in the motor-car industry.

Non-ferrous Metals

Zinc is once again in the news. On Monday the US custom smelter price was cut by ½ cent a pound for "Prime Western," East St. Louis, to a 11½ cents a pound. This is a reduction of 2 cents a pound within the last 10 days. US metal circles believe that with the outlook for the resumption of barter deals uncertain and zinc supplies heavy, custom smelters were trying a find a price at which consumers would re-enter the market in substantial volume and thus reduce smelters' stocks. The news became known in London after dealings and the quotation slipped further. It remains to be seen whether the new price level is sufficiently low to attract buying.

Lead in London eased in sympathy with the zinc price. Lead has always moved with zinc—either up or down—and there seems no reason to believe that this traditional trend will be broken in the present circumstances. Yet it must be said that there are little, if any, unsold tonnages of lead overhanging the European market and also that barter deals have been absorbing substantial tonnages over the last few months. In March the statistical evidence is that $4,400,000 worth of lead was traded.

The central item of news affecting the copper market is that a report is believed to be due in the next fortnight or so concerning new selling arrangements agreed upon by the two chief Rhodesian copper companies. Copper in London is reasonably active, but there has been little change in either the price or the contango. On Monday stocks of refined copper in LME official warehouses totalled 5,297 tons, an increase of 750 tons over the preceding week. The US market is without feature, although the general feeling concerning the outlook for the red metal is better and the so-called experts are looking for an upturn in both the price and consumption in the last four months of the year. Meanwhile, custom smelters are selling at 30½ cents per pound and export copper being traded at 30 cents. Scrap copper is on offer at 24¼ cents a pound. Weaker Eastern advices, coupled with the rise in stocks on Monday by 114 tons to 1,540 tons, brought an easier tone to the London market. A small "back" is still in being and should the rumours prove true that the buffer stock manager is buying this will tend to delay the establishment of a contango.

Latest Foundry Statistics

According to the Council of Ironfoundry Associations, employment in iron foundries suffered a decline when the count was taken on March 2. The total was 139,440, whereas in early February it was 139,833, whilst a year ago it stood at 146,172.

As reported by the Ministry of Supply, the output of aluminium castings during February was 1,663 tons from sand moulds, 2,935 tons as gravity-die and 1,161 tons as pressure-die-castings. The magnesium castings production was 217 tons. For the month earlier, the figures were, respectively, 1,834; 3,354; and 1,210 tons; with magnesium castings production at 239 tons.

International Foundry Congress

An attendance of between 1,100 and 1,200 is forecast for the International Foundry Congress to be held in Stockholm from August 19 to 25, 1957. Of this number it is expected that those attending from the UK will approach 100.

Next year's Congress is to be held at Brussels and Liège, Belgium, from September 29 to October 4, the late date being due to difficulties of accommodation arising from the exhibition to be held in Brussels earlier that year.

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Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

May 15, 1957

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £20 1s. 0d.; Birmingham, £19 13s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £21 18s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £22 2s. 3d.

Scotch Iron.—No. 3 foundry, £23 4s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £24 6s. 6d.; South Zone, £24 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £25 14s. 0d.; South Zone, £25 16s. 6d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. of England (local iron), £22 17s. 6d.; Scotland (Scotch iron), Zone S. 1, £23 4s. 0d.; Sheffield, £24 4s. 6d.; Birmingham, £24 12s. 0d.; Wales (Welsh iron), £22 17s. 6d.

Basic Pig-iron.—£19 3s. 0d. all districts.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £50 0s. 0d. to £53 5s. 0d., scale 17s. 0d. to 17s. 6d. per unit; 75 per cent. Si, £70 0s. 0d. to £76 7s. 6d., scale 17s. 0d. to 17s. 6d. per unit.

Ferro-vanadium.—50/60 per cent., 28s. 6d. per lb. of V.

Ferro-molybdenum.—65/75 per cent., carbon-free, 12s. 3d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, £260 0s. 0d.; 38/40 per cent., £299 0s. 0d.

Ferro-tungsten.—80/85 per cent., 12s. 2d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 15s. 2d. per lb. of W.

Ferro-chrome (6-10 ton lots).—4/6 per cent. C, £96 0s.0d. to £99 10s. 0d., basis 60 per cent. Cr, scale 33s. 0d. per unit; over 6 per cent. C, £94 0s. 0d., basis 60 per cent. Cr, scale 31s. 0d. to 33s. 0d. per unit; 2 per cent. C,* 2s. 2d. per lb. Cr.; 1 per cent. C,* 2s. 2½d. per lb. Cr; 0.15 per cent. C,* 2s. 3d. to 2s. 3½d. per lb. Cr; 0.10 per cent. C,* 2s. 3½d. to 2s. 3¾d. per lb. Cr; 0.06 per cent. C,* 2s. 3¾d. to 2s. 4d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 7s. 0d. to 7s. 6d. per lb.

Metallic Manganese.—90/92 per cent., carbon-free, £290 0s. 0d.; 96/98 per cent., £310 0s. 0d.

Ferro-columbium.—65/75 per cent. Nb + Ta, 22s. 0d. to 23s. 0d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £82 12s. 6d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £30 9s. 0d.; tested, 0.08 to 0.25 per cent. C, £31 9s. 0d.; hard (0.41 to 0.60 per cent. C), £32 10s. 6d.; silico-manganese, £41 0s. 0d.; free-cutting, £34 13s. 0d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £38 4s. 6d.; silico-manganese, £41 7s. 6d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £36 3s. 6d.; basic, hard, over 0.41 up to 0.60 per cent. C, £37 6s. 0d.; acid, up to 0.25 per cent. C, £40 7s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £39 2s. 0d.; boiler plates (N.-E. Coast), £41 12s. 0d.; floor plates (N.-E. Coast), £40 11s. 0d.; sectional material, N.-E. Coast, £37 11s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested (4-ton lots), £37 18s. 0d.; flats, 5 in. wide and under (4-ton lots), £37 18s. 0d.; hoop and strip, £37 17s. 6d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £41 6s. 0d.; black sheets (hand mill), 17/20 g., £52 4s. 6d.; galvanized corrugated sheets, 24 g., £65 9s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £65 10s. 3d.; nickel-chrome, £92 13s. 0d.; nickel-chrome-molybdenum, £104 11s. 6d.

NON-FERROUS METALS

Copper.—Cash, £237 5s. 0d. to £237 10s. 0d.; three months, £236 5s. 0d. to £236 10s. 0d.; settlement, £237 10s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 2s. 3½d. per lb.; rods, 271s. 3d. per cwt. basis; 20 s.w.g., 304s. 6d. per cwt.

Tin.—Cash, £764 0s. 0d. to £765 0s. 0d.; three months, £761 10s. 0d. to £762 10s. 0d.; settlement, £765 0s. 0d.

Lead (Refined Pig).—Second half May, £95 0s. 0d. to £95 5s. 0d.; second half August, £96 15s. 0d. to £97 0s. 0d.

Zinc.—Second half May, £85 0s. 0d. to £85 5s. 0d.; second half August, £80 0s. 0d. to £80 5s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £115 0s. 0d.; rolled zinc (boiler plates), all English destinations, £112 15s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £105.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 10½d. per lb.; rods, drawn, 2s. 11d.; sheets to 10 w.g., 206s. 6d. per cwt.; wire, 2s. 7⅛d.; rolled metal, 203s. 9d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £171; B6 (85/15), £231; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £225; HTB2 (38 tons), —; HTB3 (48 tons), £258.

Gunmetal.—BS1400, LG2 (85/5/5/5), £230; LG3 (86/7/5/2), £241; G1 (88/10/2/½), £293; (88/10/2/1), £282.

Phosphor Bronze.—BS1400, PB1 (AID released), £299 per ton.

Phosphor Bronze Strip, etc.—Strip, 291s. 0d. per cwt.; sheets to 10 w.g., 290s. 0d. per cwt.; wire, 4s. 0d. per lb.; rods, 3s. 4½d.; tubes, 3s. 4½d.; chill cast bars: solids 3s. 3½d., cored 3s. 4½d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 10d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 2½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 1½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £210 0s. 0d. Quicksilver, ex-warehouse, £88 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £197 0s. 0d.; aluminium bronze (BS1400), AB1, £262; AB2, £275.

* Average 68-70 per cent.